3.3.4

NUMBER OF RESEARCH PAPERS PER TEACHER

Sri SAIRAM COLLEGE OF ENGINEERING
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Content

3.3.4 Number of research papers per teacher in the Journals notified on UGC website during the last five years

SL NO	ACADEMIC YEAR	DOCUMENTS	NUMBER OF PUBLISHED JOURNALS
1	2017-18	FULL LENGTH PAPER OF NATIONAL/INTERNATIONAL PUBLISHED JOURNALS	35
2	2016-17	FULL LENGTH PAPER OF NATIONAL/INTERNATIONAL PUBLISHED JOURNALS	50
3	2015-16	FULL LENGTH PAPER OF NATIONAL/INTERNATIONAL PUBLISHED JOURNALS	17
4	2014-15	FULL LENGTH PAPER OF NATIONAL/INTERNATIONAL PUBLISHED JOURNALS	5
5	2013-14	FULL LENGTH PAPER OF NATIONAL/INTERNATIONAL PUBLISHED JOURNALS	3

Co-ordinator

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Publication Details

Department	2018-19	2017-18	2016-17	2015-16	2014-15	2013-14	Total
CSE	11	27	45	11	3	-	97
ECE	16	2	-	1	-	1	20
MECH	0	1	-	4	-	-	5
EEE	5	4	3	-	-	-	12
S & H	1	1	2		2	2	9
Total	33	35	50	17	5	3	143

3.3.4 Number of research papers per teacher in the Journals notified on UGC website during the last five years (8)

Sl.No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISBN/ISSN number	Link of the recognition in UGC enlistment of the Journal
1	Design and automation of cylinder head valve guide groove detection system	Mrs. Ramya.R	Mechanical Engineering	IJMPE	2017-18	2320-2092	http://ijmpe.iraj.in/paper_detail.php?paper_id=11434&name=Design_and_Automation_of_Cylinder_Head_Valve_Guide_Groove_Detection_System
2	Vector control of PMSM take over by photovoltaic source	K RAMYA	EEE	ACES JOURNAL, Vol. 33, No. 2	2017-18	ISSN: 1054-4887	https://www.researchgate.net/publication/324674699_Vector_control_of_PMSM_take_over_by_photovoltaic_source
3	Unstructured Text to DBPEDIA RDF Triples-Entity Extraction	Raghavendra Rao	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijerece.com/abstract.php?id=11598
4	Under water Autobot	Shalini KV	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11483&issue=Issue11
5	Traffic Control in 4G Technology through Iterative Serve	M.SheelaDevi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11488&issue=Issue11
6	Traffic congestion reduction , automatic accident detection and ambulance rescue alerts using smartphone and WSN	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11486&issue=Issue11
7	Survey on Automation system using Raspberry Pi-03	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11492&issue=Issue11
8	Survey on applications of image processing in agricultural field	Sowjanya S Reddy	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11509&issue=Issue11

9	Smart Trolley in mega mall	Manjula G	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11514&issue=Issue11
10	Smart New Era Agri Applications Using Optoelectric System	K RAMYA	EEE	Journal of Computational and Theoretical Nanoscience. Volume 15, Number 6/7 (June/July 2018) Page No.2251-2254.	2017-18	ISSN: 1546-1955	https://www.researchgate.net/publication/329097218_Smart_New_Era_Agri_Applications_Using_Optoelectric_System
11	SMART HOSPITALS USING INTERNET OF THINGS (IOT)	Lorate Shiny	Computer Science and Engineering	International Journal of Computer Engineering and Applications,	2017-18	ISSN 2321-3469	http://www.ijcea.com/wp-content/uploads/2018/05/14.SMART-HOSPITALS-USING-INTERNET-OF-THINGS-IOT.pdf
12	Pipe Scales and Biofilm Formation Measurement	Kalamani.P	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijerece.com/abstract.php?id=11591
13	Phishing: Threats & challenges	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11477&issue=Issue11
14	Online voting system	Sowmya AM	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11512&issue=Issue11
15	New Analysis for Identification of Eye Diseases from the Blood Sample Values	B.Srilatha	ECE	IEOH Journal of Ecophysiology and Occupational Health	2017-18	ISSN (Online) : 0974-0805	##########
16	New Analysis for Identification of Eye Diseases	B.Srilatha	ECE	International Journal of Control Theory and Applications	2017-18	ISSN: 0974-5572	##########

17	Life- Your Heart Speaks Your Password	Manjula G	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2321	http://ijercse.com/abstract.php?id=11482&issue=Issue11
18	IOT: Trends,Challenges & Future Scope	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11479&issue=Issue11
19	IOT	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11481&issue=Issue11
20	Intellect: A brain controlled multi User video Game for Enhancing cognition	Nisha MS	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11480&issue=Issue11
21	Information sharing by block chain technology for supply chain management	Divya prabha	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11522&issue=Issue11
22	Industrial Automation using internet of things (IoT)	Nisha MS	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11487&issue=Issue11
23	INDUSTRIAL AUTOAMTION USING INTERNET OF THINGS (IOT)	Lorate Shiny	Computer Science and Engineering	International Journal of Computer Engineering and Applications,	2017-18	ISSN 2321-3469	http://www.ijcea.com/wp-content/uploads/2018/05/18.INDUSTRIAL-AUTOAMTION-USING-INTERNET-OF-THINGS-IOT.pdf

24	Fuzzy and De-Coupled d-q Control Strategy in Riven Bias Inverter for Islanding Operation in Microgrid	K RAMYA	EEE	Journal of Computational and Theoretical Nanoscience. Volume 15, Number 6/7 (2018) Page No.2121-2125.	2017-18	ISSN: 1546-1955	https://www.ingentaconnect.com/content/asp/jctn/2018/00000015/00000006/art00053
25	Future of cloud computing in it field 2020	Bindu Madavi	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11511&issue=Issue11
26	Energy Efficiency Improvement in Renewable Distribution System (RDS) Synchronized with Riven Bias Inverter and Reactive Power Control	K RAMYA	EEE	Journal of Computational and Theoretical Nanoscience. Volume 15, Number 6/7 (2018) Page No.2115-2120.	2017-18	ISSN: 1546-1955	https://www.researchgate.net/publication/329100528 Energy Efficiency Improvement in Renewable Distribution System RDS Synchronized with Riven Bias Inverter and Reactive Power Control
27	Electronic Healthcare consultation system(E-consults)	Pradeepa C	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11485&issue=Issue11
28	Cyber security: Computer viruses	Saanjana	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11478&issue=Issue11
29	Cryptographically securing the data transfer to cloud from Mobile devices using Csprn generation	Arpitha Vasudev	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11491&issue=Issue11

30	Artificial Intelligence	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=11489&issue=Issue11
31	ARDUINO BASED AUTOMATIC IRRIGATION SYSTEM	Lorate Shiny	Computer Science and Engineering	International Journal of Computer Engineering and Applications,	2017-18	ISSN 2321-3469	http://www.ijcea.com/wp-content/uploads/2018/06/43.ARDUINO-BASED-AUTOMATIC-IRRIGATION-SYSTEM.pdf
32	APPLICATIONS OF IMAGE PROCESSING IN AGRICULTURAL FIELD	Lorate Shiny	Computer Science and Engineering	International Journal of Computer Engineering and Applications,	2017-18	ISSN 2321-3469	http://www.ijcea.com/wp-content/uploads/2018/05/15.APPLICATIONS-OF-IMAGE-PROCESSING-IN-AGRICULTURAL-FIELD.pdf
33	Application of vectors	Mrs. Manjula S	Mathematics	IJERCSE	2017-18	ISSN 2394-2320	https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i11/Ext_34027.pdf
34	An Unsolicited Heart Stroke Alert System for Humans	Jeyadevan	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2322	http://ijercse.com/abstract.php?id=11669&issue=Issue11
35	A Survey on Water Quality Analysis for Industrial Application under IOT Environment	Kalamani P	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017-18	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10342&issue=Issue5
36	Vehicle health Monitoring system using CAN	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10363&issue=Issue5
37	Tracking down of projectile and robotic demolish	Shalini KV	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6392&issue=Issue11

38	Survey on detecting Malcious facebook application	M.Sheeladevi	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6400&issue=Issue11
39	Study on Improved Performance Modeling Message Dissemination in VANET Using DSRC	M.Sheeladevi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6404&issue=Issue11
40	Stock Conservation	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10349&issue=Issue5
41	Spruceness in City Roads	T.K Pradeep Kumar	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6401&issue=Issue11
42	Speech Enhancement of alt Speech using Spectral Subtraction and template Matching	D.A.Vennila	EEE	Journal of Chemical & Parametric Science	2016-17	ISSN: 0974-2115	https://www.jchps.com/specialissues/2017%20Special%20Issue%2011/EC1755.pdf
43	Solar Based E – Uniform for Soldiers	Myneni Chandana	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10350&issue=Issue5
44	Smart Power Gen Using Renewable Sources With Intelligent Energy Storage System In Grid	K RAMYA	EEE	International Journal For Research In Applied Science & Engineering Technology (IJRASET)	2016-17	ISSN: 2321-9653	https://pdfs.semanticscholar.org/a24e/251af941078d08a1a23a4000e30f24a8ef2c.pdf

45	Smart phone operated wheel chair using voice and body gesture	Manjula G	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6394
46	Smart home security through NFC	Rejithomas	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://ijercse.com/abstract.php?id=6391&issue=Issue11
47	Smart guide extension for Blind cane	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6402&issue=Issue11
48	Smart Farming using Arduion Technology	S Jeyadevan	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6395&issue=Issue11
49	Smart controller fed non Conventional Microgrid for Optimal Power distribution	Lorate Shiny	Computer Science and Engineering	Science Direct - Elsevier publication	2016-17	ISSN:2214-7853	https://www.sciencedirect.com/science/article/pii/S2214785317324707
50	Smart bus	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i3/39.pdf
51	Sanjeevvani Drone	Raghavendra Rao	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERECE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10353&issue=Issue5
52	Rising data availabity in cloud using graining concepts	Raghavendra Rao	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=739
53	Relief Algorithm to Avoid Black Hole Assault in AODV Routing for MANET Using Real Time Monitoring	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6390&issue=Issue11

54	Public water supply grid monitoring to avoid tampering and water man fraud using IOT	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10341&issue=Issue5
55	Peristaltic flow of a Newtonian fluid in an inclined channel under the effect of Hall Current	Dr.P.Gangavathi	Mathematics	IJSEM	2016-17	ISSN 2394-2320	https://www.technoarete.org/common_abstract/pdf/IJSEM/v4/i5/Ext_54396.pdf
56	Mobile Applications In Context of Big Data A survey	M.Sheeladevi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i3/35.pdf
57	Misbehaving Node Detection using Secure Acknowledgement in MANET	Manjula G	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10357&issue=Issue5
58	Li-Fi The future Technology in Wireless Communication	Raghavendra Rao	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://www.journal.bonfring.org/papers/sesc/volume6/BIJ-8241.pdf
59	Intelligent fire extenguisher system	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10355&issue=Issue5
60	Inspecting the result of renewable energy source of solar botanic trees using nano piezo electric elements	Manjula G	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=688
61	Inhibition of corrosion of mild steel in 2M HCl by Determination of optional experimental parameters using factorial Design- A preliminary study	Dr.S.Harikrishna	Chemistry	International Journal of hem.. tech Research	2016-17	ISSN 0974-4290	http://www.sphinxsai.com/2017/ch_vol10_no4/2/(397-403)V10N4CT.pdf

62	Glide player	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10340&issue=Issue5
63	Future aspects and key challenges of IOT	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10362&issue=Issue5
64	Energy Saving Through Smart Home	Rejithomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6397&issue=Issue11
65	Encryption protocol for securing MANET-L to S	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10360&issue=Issue5
66	E-Bin for waste segregation	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10352&issue=Issue5
67	Dustless Environment by Transportation means	T.K Pradeep Kumar	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10356&issue=Issue5
68	Digital Forensics,Cyber Crime and Datamining	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6409&issue=Issue11

69	Digibin-A smart way of sorting solid waste	Shalini KV	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10361&issue=Issue5
70	Design & analysis of ModernSwitching Sequence for Bus Clamping Techique used in Hybrid power System with SVPWM Method	MS.R. Gunasekari	EEE	Journal of Chemical & Parametric Science	2016-17	ISSN: 0974-2115	https://www.jchps.com/specialissues/2017%20Special%20Issue%2011/EC1768.pdf
71	Crawler Bot	Shalini KV	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10339&issue=Issue5
72	Brain to Brain communication	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6393&issue=Issue11
73	Biometric Verification Using Face Recognition	P.Manikandan	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6398&issue=Issue11
74	Autonomous Agile Flying Robot (Quad rotor)	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6410&issue=Issue11
75	Automatic headlight dipper	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6403&issue=Issue11

76	Automated Content Based Short Text Classification forFiltering Undesired Posts on Facebook	Myneni Chandana	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6406&issue=Issue11
77	Applying Intermittent energy distribution for evading energy holes in wireless sensor network	Sowmya AM	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=738
78	Android Speech Recognition Based Voice Command Notice Board	Manikandan	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10337&issue=Issue5
79	Andriod application on creating awareness on Illegal activities in Forest	Lorate Shiny	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=687
80	An Effective and Reliable data routing using Aggregation techniques in WSN	Shalini KV	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6408&issue=Issue11
81	Agrikart: A new Revolution Agriculture	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10351&issue=Issue5
82	A survey of Routing protocols in Moblie Adhoc networks	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10358&issue=Issue5
83	A Futuristic Approach For Towerless Mobile Networks	P.Kalamani	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6405&issue=Issue11

84	An Efficient Approach to Reduce Network Partitioning Using AMMNET	G.manjula	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6389&issue=Issue11
85	Agribot-"Future Farmer's Friend"	Santhi Priya	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10338&issue=Issue5
86	Spectrum sharing scheme to minimize overlapping channels in AMMNET	Sowmya AM	Computer Science and Engineering	International Journal of Engineering research & technology(IJERT)	2015-16	ISSN:2278-0181	https://www.ijert.org/icesmart-2015-volume-3-issue-19
87	Positioning of mobile sink in the efficient and best position in the wireless sensor network	Arpitha Vasudevan	Computer Science and Engineering	International Journal of Engineering research & technology(IJERT)	2015-16	ISSN:2278-0181	https://www.ijert.org/research/positioning-of-mobile-sink-in-the-efficient-and-best-position-in-the-wireless-sensor-network-IJERTCONV3IS19016.pdf
88	Plant diseases detection using Image processing techniques	Saanjana	Computer Science and Engineering	IJIRSET	2015-16	ISSN:2347-6710	https://ijetae.com/files/ACCE15/IJETAE_ACCE_15_04.pdf
89	Opinion Mining	Lorate Shiny	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2015-16	ISSN:2250-1046	http://journal.bonfring.org/special_issue.php?id=8
90	Numerical Simulation of Ship Hull Interaction	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
91	Numerical Simulation of a Cyclone Separator	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
92	Invisibility System using image Processing and opticalcamouflage technology	Kalamani P	Computer Science and Engineering	International journal of Advanced research in science & engineering	2015-16	ISSN:2319-8354(E)	http://ijarse.com/currentissue.php?id=89
93	Increasing efficiency of mobile sink WSN using global best positionaing mechanism	Arpitha Vasudevan	Computer Science and Engineering	International Journal of Emerging technology and Advanced Engineering	2015-16	ISSN:2250-2459	https://ijetae.com/ACCE15.html

94	Hyperbolic Tangent Fluid Flow Through A Porous medium in an Inclined Channel with Peristalsis	Dr.P.Gangavathi	Mathematics	IJASRM	2015-16	ISSN 2455 6378	http://ijasrm.com/wp-content/uploads/2016/04/IJASRM_V1S4_035_113_121.pdf
95	Extraction of diabetic and eye diseases from the retinal images using image processing algorithms	B.Srilatha	ECE	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ugc.ac.in/journallist/subjectwisejournallist.aspx?tid=SW50ZXJuYXRpb25hbCBKb3VybmFsIG9mIEFwcGxpZWQgRW5naW5lZXJpbmcgUmVzZWFyY2g=&&did=Q3VycmVudCBhbmQgQ2Vhc2VkIFRpdGxlcw==
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DESIGN AND AUTOMATION OF CYLINDER HEAD VALVE GUIDE GROOVE DETECTION SYSTEM

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Abstract - The power required to drive an automobile is obtained by burning the fuel in the engine. This combustion process requires the mixture of air and fuel in proper quantity. This mixture is sent into the combustion chamber through the valves. They are valves present at both inlet and exhaust. The valve guides and valve seats are crucial for proper working of the valves. The valve guide serves to positively locate the valve so that it makes a proper contact with the valve seat. A valve guide is a cylindrical part pressed into the cylinder head, with the valve reciprocating in it. Guides serve also to conduct heat from the combustion process out from the exhaust value and into the cylinder head where it may be taken up by the cooling system. Manual pressing of valve guides into the engine led to several physical ergonomic problems like lack of safety, severe operator discomfort and difficulty of operation. It led to less production and improper seating of valve guide, resulting in variation of spec. The improper seating affects several factors like the valve timing, the combustion process inside the combustion chamber, the volumetric efficiency, ignition delay, etc. it leads to an increase amount of scrap and an increase of material cost. This machine is used to press 16 valve guides into the cylinder to the required depth and at uniform pressure without any manual assistance. The installation of automatic valve guide pressuring machine as led to the detection of cycle time and improvement in quality in the production of cylinder heads. The man power required to manually press the valve guide as also been eliminated thus resulting in cost savings. Engine cooling is also improved as the proper seating ensured that the valve guides should properly conduct the heat from the exhaust. The automation of kappa cylinder head valve guide groove detection system was done by us as a part of this automation process which detects and corrects the alignment of the valve guides. This eliminates manual loading thus improving the quality and reducing the scrap.

Index terms - cylinder head, Automation, design, Valve, Groove detection system

I. INTRODUCTION

An **engine** or **motor** is a machine designed to convert heat energy into useful mechanical motion. Heat engines, internal combustion engines and external combustion engines (such as steam engines) burn a fuel to create heat, which then creates motion. Electric motors convert electrical energy into mechanical motion, pneumatic motors use compressed air and others such as clockwork motors in wind-up toys use elastic energy. In biological systems, molecular motors, like myosin's in muscles, use chemical energy to create motion.

The Engine Plant 2 is 90% of automation and only 10% of manual interruption. This section is divided into 7lines. A line consists of several machines one after the other to perform sequential operation in order to get the required finished product.
Three components are manufactured in the engine assembly line. They are:

1. Cylinder Block
2. Cylinder Head
3. Crank Shaft

All machining processes are done simultaneously in their respective lines. Then the finished components are assembled in the assembly line.

II. PROBLEM IDENTIFIED

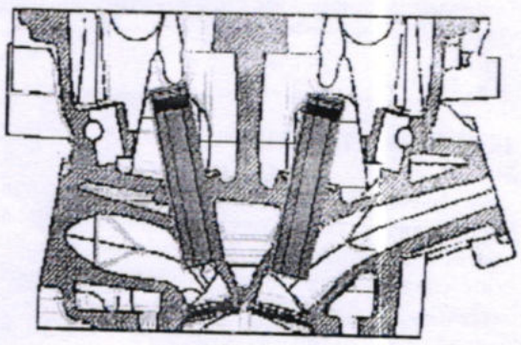
Any industry aims at increasing the quality of the product and in cost saving. In cylinder head line process, the part rejection occurs at various stages. This causes wastage of material which ultimately increases the cost. Each process was analyzed individually and part rejections were tabulated for each process. The total number of rejected parts was 52 for a month In this, it was found that, the rejected parts were distributed in machine 10, 40, 60, 70,100,130,150 and170.We could conclude from the graph that the number of parts rejected. The part rejection occurring in machine 100 is a critical problem that has arisen due to the change in design of the valve guide. To protect the environment from pollution, every country has set up a range of emission for NO_x, CO_2, and SO_2 within which the emission from the cars should lie. Since the cylinder head is not manufactured in the plant and is bought from vendors, wrong insertion of the valve guide will cause rejection of the entire cylinder block and leads to an increase in the scrap rate which ultimately affects productivity.

The valve guide feeding machine is used to feed the valve guide to engine cylinder head. The machine is designed in the way that it identifies the correct position of the valve guide and sends to conveyor. In the feeding machine there a sensor that senses the

tapered degree near grove part and identify the correct position of the guide and sent to conveyor. This was the oldest method that has been used. After changing the tapered degree near the grove the sensor cant able to sense the small tapered angle. So there was a lot of disturbance in feeding machine. They analyses many type of sensor and mechanical movement to get the correct position of the guide.

Failure In Various Model Of Feeding Machine

To reduce a manual work in the valve guide feeding machine a various methods has been used to identify the correct position of the valve guide. At first stage fiber optics sensor has been used to identify the correct position of the valve guide. It was failure because small angle of tapered can't be identified so the process is failed. At the second stage a photo electric sensor has been used t identify but it also fail's in identifying more number of value guide. The sensor should be replaced at particular time interval and it also a failure process.At the next stage they used an sensor called wenglor senor combined with the mechanical movement. After identification the sensor send the comment to circular plate and change the direction and sent the valve to conveyer.



GO DIRECTION

Problem In Valve Guide Feeding Machine

NO GO DIRECTION

Figure 1:Valve Guide Feeding Direction

Defects When Valve Guide Positioned Wrong

If the valve guide is in the wrong direction the valve guide pressing maching presses the valve guide in the wrong direction which leads to vigorous effect in the engine's further assembly process. So there should be an immense care while feeding the valve guide in to the pressing machine to avoid a major descripensy in the process

There are 16 valve guides that should be inserted in to the engine block (i-e) 8 valve guides for inlet and other 8 valve guides for outlet

Some of the problems identified in assembly process after wrong loading of the valve guide are as follows

1. Stem cell can't be placed firmly
2. Valve spring failure
3. Cotter assembly failure and goes on
4. Leakage problems and efficiency problems in the engine also occurs
5. Whole set up failure

These leads to man power loss, machining loss, material loss, power loss which occurs while reworking in the concerned wrongly loaded engine

III. NEW SOLUTION TO RECTIFY THE PROBLEM IN MACHINE

Vision Detection System

In this type of detection system a master photo of valve guide in proper position is fed to the computer. When the valve guide comes from the bowl feeder, the vision detection system takes its picture and compares it with the master picture, if it is proper position, the process continues and the valve guide goes into the linear feeder. Else the position of the valve guide is changed either manually or using rotary mechanisms.

Air Detection System

The detection system sense the position of the valve guide by making use of the pressure difference created between the groove and the chamfer side. The pressure difference is sent as a feedback to the rotary table. With respect to the position of the valve guide, the rotary table will act. If it is in the correct position, it will directly allow the valve guide to the linear feeder.

Rotary Index Table

A rotary index table is a circular table that rotates in discrete intermittent steps to advance parts between stations located along its perimeter. Rotary index tables are used for the synchronous transfer of small parts from station to station in a single work center. Since each part moves between stations at the same time, it is difficult to put buffers between stations. After the detection by the air and vision system the feedback in sends to the rotary index table. If the position is wrong then the rotary table rotates 180^0 and then allows the valve guide to the linear feeder. Where it is arranges in a linear manner in a uniform

way and it feed to the indexing table where the valve guide is positioned in a sequential manner.

IV. CONSTRUCTIONAL DETAILS

Components Of Cylinder Head:

1. Exhaust
2. Valves
3. Spark Plug And Injector Mount
4. Camshaft
5. Cvvt (Continuously Variable Valve Timing)
6. Head Gasket

I.

II.

Machine Components

1. Hydraulic Cylinder
2. Pneumatic Cylinder

Parts Of Valve Guide Pressing Machine

1. Hooper Feeder
2. Bowl Feeder
3. Linear Feeder
4. Indexing Table
5. Servo motors

Parts Of Press Head

The important parts of the press head are:

1. Head
2. Spindle
3. Hydraulic Cylinders
4. Servo Motors

Parts Of Head Tilter

The important parts of a head tilter are:

1. L-Arm
2. Clamp
3. Servo Motor

V. WORKING

1. Valve guide is feed into the vibrating hopper.
2. Due the vibration in the hopper the valve guide moves towards the bowel feeder
3. Bowel feeder also vibrates and arrange the valve guide in a sequential order
4. The valve guide are moves to the linear feeder
5. While moving to the linear feeder the valve guide are checked for the correct position by using air and vision sensor
6. The air sensor passes the air from the pneumatic cylinder to valve guide at both the side. And check the correct go direction
7. After passing to air sensor the guide moves towards the vision guide system.
8. The valve guide is inspected by the vision inspection system and identifies the correct go direction.
9. If no go direction is identified the vision sensor sends the feedback to the rotary mechanism and its turn the valve guide in the correct position and sent to linear feeder.
10. The linear feeder sends the guide to indexing mechanism plate.
11. From the indexing mechanism the guide is inserted to the servo mechanism by using small pneumatic piston.
12. From the servo mechanism the valve guides are taken by the pressing tool and dipped in lubricating oil.
13. Then the valve guide is pressed into the cylinder head. The head is tilted into some angle to insert the valve guide easily for the both inlet and exhaust valve.

VI. DESIGN CALCULATION

Data Known

Pressure = 2 bar; Density of valve guide material = 7.8 g/cm^3;
Compressive strength of V.G = 650 N/mm^2.

Cylinder 1

Bore dia d1 = 20 mm
Piston dia d2 = 7.5 mm
Stroke (l) = 20 mm
Force executed by the cylinder = Area × Pressure

$$= \pi/4 \times (d1^2 - d2^2) * 0.2$$
$$= \pi/4 \times (20^2 - 7.5^2) * 0.2$$
$$= 54 \text{ N}$$

Force valve guide can withstand:
Compressive strength = Force / Area

$$\text{Force} = 650 \times \pi (r1 - r2) \times l$$
$$= 650 \times \pi (9 - 4) \times 5$$
$$= 51 \text{ kN}$$

Since the force withstand by the valve guide is higher than the force executed by the cylinder. Hence the valve guide is safe.

Cylinder 2

Bore dia d1 = 20 mm
Piston dia d2 = 7.5 mm
Stroke (l) = 20 mm
Force executed by the cylinder = Area × Pressure

$$= \pi/4 \times (d1^2 - d2^2) \times 0.2$$
$$= \pi/4 \times (20^2 - 7.5^2) \times 0.2$$
$$= 54 \text{ N}$$

Dimensions of valve guide:

Length = 46 mm
Outer diameter = 9 mm
Inner diameter= 4 mm
Groove depth= 2 mm
Taper angle = 2^0

Material:

Pearlite cast iron

Weight of the valve guide

Mass = density × volume

$$= 7.8 \times 10^{-3} \times \pi/4 \times (d1^2 - d2^2) \times l$$
$$= 7.8 \times 10^{-3} \times \pi/4 \times (9^2 - 4^2) \times 46$$
$$= 30 \text{ grams} = 0.3\text{N} + 0.2\text{N} = 0.5\text{N}$$

Here the force executed by the cylinder 2 is greater than the weight of the valve guide and hence the valve guide is pulled by the cylinder.

Cylinder 3

Bore dia d1 = 20 mm

Piston dia d2 = 5 mm

Stroke (l) = 65 mm

Force executed by the cylinder = Area × Pressure

$= \pi/4 \times (d1^2 - d2^2) \times 0.2$

$= \pi/4 \times (20^2 - 5^2) \times 0.2$

$= 59$ N

The force executed by the piston is higher than the weight of the valve guide so it pushes the valve guide with ease.

Design for valves

Valve diameter = 60mm, Pressure = 4 Mpa, safe stress = 46 Mpa, k = 0.2, $\vartheta = 30°$

To find: Thickness of the valve head, (t)

Stem diameter. (d) : Max lift of the valve, (h)

Solution

We know the thickness of the valve head,

$$t = k \times d \times \sqrt{\frac{p}{\sigma}}$$

$$t = 0.42 \times 60 \times \sqrt{\frac{4}{46}} = 7.43 \text{ say } 7.5 \text{ mm}$$

we know the stem diameter,

$$t = \frac{d_p}{8} + 6.35 = \frac{60}{8} + 6.35 = 13.85 \text{ say } 14 \text{ mm}$$

we know that maximum lift of the valve ,

$$h = \frac{d_p}{4 \cos \alpha} = \frac{60}{4 \cos 30°} = 17.32 \text{ say } 17.4 \text{ mm}$$

Design For Valve Spring

W_1 = initial spring force (f_s) = 96.6 N

Load st full lift

W_2 = full valve lift × stiffness of spring (s) = 25 × 10 = 250 N

Therefore total load on the spring,

$$W = W_1 + W_2 = 96.6 + 250 = 346.6 \text{ N}$$

Mean diameter of spring coil

D = mean diameter of the spring coil

D_0 = diameter of the spring wire

Wkt, Wahl's stress factor,

$$K = \frac{4C-1}{4C-4} + \frac{0.615}{C} = \frac{4\times8-1}{4\times8-4} + \frac{0.615}{C} = 1.1814$$

Max shear stress (τ).

$$\tau = K \times \frac{8WC}{\pi d^2} = 1.1814 \times \frac{8\times346.6\times8}{\pi d^2}$$

$$420 = \frac{8360}{d^2}$$

$$d^2 = \frac{8360}{420}$$

$d^2 = 19.9$

$d = 4.46$ mm

Mean diameter of the spring coil,

$$D = C \times d = 8 \times 4.47 = 35.76 \text{ mm}$$

Outer diameter of the spring coil,

$$D_0 = D + d = 35.76 + 4.47 = 40.23 \text{ mm}$$

Number of turns of the coil

Let n = number of active turns of the coil.

Wkt, max compression of the spring, since stiffness (s) $= \frac{W}{\delta} = 10$

$$\delta = \frac{8WC^3n}{Gd}$$

$$\frac{\delta}{W} = \frac{8C^3n}{Gd}$$

$$\frac{1}{10} = \frac{8\times8^3\times n}{84\times10^3\times4.47} \qquad n = 9.17$$

$n = 10$

for squared and ground ends, the total number of the turns,

$n^1 = n + 2 = 10 + 2 = 12$

Free Length Of The Spring

Since the compression produced under $W_2 = 250$ N is 25 mm (i.e equal to full valve lift), therefore, max compression produced (δ_{max}) under the maximum load of W = 346.6 N is

$$\delta_{max} = \frac{25}{250} \times 346.6 = 34.66 \text{ mm}$$

We know that the free length of the spring,

$L_f = n^1 d + \delta_{max} + 0.15\,\delta_{max}$

$= (12 \times 4.47) + 34.66 + (0.15 \times 34.66)$

$L_f = 93.5$ mm

Pitch of the Coil

Wkt,

$$\text{Pitch of the coil} = \frac{L_f}{n^1 - 1} = \frac{93.5}{12-1} = 8.5 \text{ mm}$$

The pitch of the coil is found to be 8.5mm.

Figure 2: 3-D View Of Valve Guide Pressing System

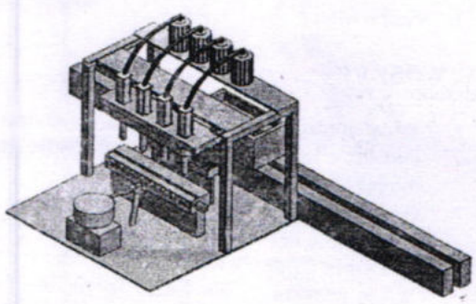


Figure 2: 3-D View Of Valve Guide Pressing System

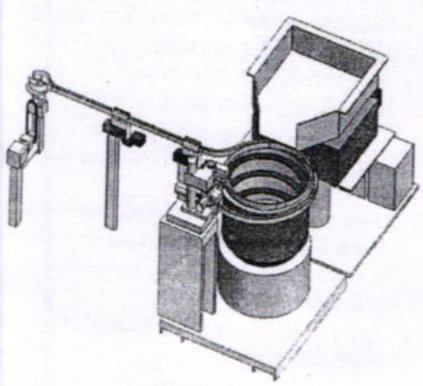


Figure 3: View Of New Valve Guide Feeding System

CONCLUSION

BEFORE:

No detection for cylinder head valve guide groove direction. Manual loading of valve guide done in valve guide pressing stage .Possibility of not assembling the valve guide in wrong direction. No alert for operator if valve guide is assembled in wrong direction.

AFTER:

Automatic valve guide groove detection system introduced through air sensor & vision system. Auto loading of valve guide done in v/g pressing m/c. Checking system interfaced with conveyor if valve guide loaded in wrong direction. Alert for operator if valve guide not assembled. One man power/day used for manual feeding.

The improved results in the valve guide pressing machine can be witnessed with the help of the above information. By comparing the two columns, we can see the benefits that we can achieve with the help of the new method implemented. Since this new method eliminates the wrong insertion of valve guide, the cycle time for the process is reduced, part rejection can be minimized, efficiency can be improved, quality of the product can be enhanced and hence the productivity of the company is improved. Thus by implementing this new air sensor groove detection method we can accomplish our objectives in an economic and efficient way.

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★★★

Vector Control of PMSM Take Over by Photovoltaic Source

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Abstract — This article established with the modeling and the field oriented control of permanent magnet synchronous machines, with a focus on their applications in variable speed domain in photovoltaic source.

Index Terms — Field oriented control, inverter, permanent magnet synchronous machine, photovoltaic.

I. INTRODUCTION

The permanent magnet synchronous motor (PMSM) has three phases winding on stator represented by the three axes (a, b, c) phase-shifted of 120° with respect to each other (Fig. 1) and has permanent magnets in the rotor ensuring its excitation. Depending on how the magnets are placed, we can distinguish two types of rotors; in the first type, the magnets are mounted on the surface of the rotor with a homogeneous air gap, the motor is called "smooth air gap PMSM" and inductors are independent on the rotor position. In the second type, the magnets are mounted inside the rotor mass and the air gap will vary because of the salience effect. In this case, inductors are highly dependent on the rotor position. Synchronous motors have a remarkable feature; the speed is constant regardless of the load. The field oriented control (FOC) is used for many years. It implements Park transformation which shows, like a separately excited dc machine, the expression of the instantaneous torque as a product of magnetic flux and current. In addition, there is the possibility to reduce the oscillations for a desired torque, to save energy delivered, to reduce the current harmonics and to improve power factor. When the motor model used is correct, the FOC works well [1-6].

II. DYNAMIC MODEL OF SYNCHRONOUS MOTOR

A. Mathematical model of PMSM

The dynamic model of a permanent magnet synchronous motor with rotor reference frame can be described by the equations below, considering the conditions of non-saturation of the magnetic circuit and the magneto motive force MMF is a sinusoidal distribution created by the stator windings:

$$[V_{abc}] = [RI_{abc}] + \frac{d(\varphi_{abc})}{dt}, \tag{1}$$

$$[V_{abc}] = \begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix}; [i_{abc}] = \begin{bmatrix} i_a \\ i_b \\ i_c \end{bmatrix}; [\varphi_{abc}] = \begin{bmatrix} \varphi_a \\ \varphi_b \\ \varphi_c \end{bmatrix} [R] = \begin{bmatrix} R & 0 & 0 \\ 0 & R & 0 \\ 0 & 0 & R \end{bmatrix}, \tag{2}$$

with $V_{abc}, i_{abc}, \phi_{abc}$ representing the stator phases' voltages, the stator phases' currents and the total flux produced by the stator currents. R indicates the resistance of a stator phase.

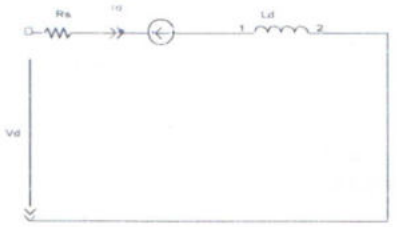

Fig. 1. Equivalent circuit of a permanent magnet synchronous motor in the dq frame.

Total fluxes are expressed by:

$$(\varphi_{abc}) = (L)(i_{abc}) + (\varphi'_{abc})$$

$$L = \begin{bmatrix} L_{ss} & M_s & M_s \\ M_s & L_{ss} & M_s \\ M_s & M_s & L_{ss} \end{bmatrix}, \tag{3}$$

L_{ss} and M_s representing the self-inductance and the mutual inductance between stator windings. ϕ'_{abc} is the rotor flux seen by the stator windings. It represents the amplitudes of the voltages induced in the stator phases without load. Substituting (3) in (1):

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$$[V_{abc}]=(R)(i_{abc})+L\frac{d(i_{abc})}{dt}+\varphi_{abc}. \quad (4)$$

The electromagnetic torque is expressed by:

$$T_e=\frac{1}{\omega_r}(e_{abc})^t(i_{abc}), \quad (5)$$

where $e_{abc}=\frac{d(\phi_{abc})}{dt}$ represents the electromotive forces generated by the stator phases. ω_r is rotation speed of the rotor in [rad/s]. Note that the system (4) leads to joined and highly non-linear equations. To simplify this problem, the majority of research in literature prefer to use the Park transformation which, by a transformation applied to real variables (voltages, currents and flux), provides fictive variables called dq components of Park's equations. Physically, this transformation is interpreted as a substitution for stationary windings (a,b,c) by rotating windings (d,q) which rotate with the rotor. This transformation makes the dynamic equations of AC motors simpler. The Park transformation is defined as follows:

$$(x_{dq0})=(K_\theta)(x_{abc}), \quad (6)$$

where X may be a current, a voltage or a flux and θ is the rotor position. X_{dq} represent longitudinal and transversal components of the stator variables (voltages, currents, fluxes and inductances). The transformation matrix K_θ is by:

$$[K_\theta]=\sqrt{\frac{2}{3}}\begin{bmatrix}\frac{1}{\sqrt{2}} & Cos\theta & -Sin\theta\\ \frac{1}{\sqrt{2}} & Cos\left(\theta-\frac{2\pi}{3}\right) & -Sin\left(\theta-\frac{2\pi}{3}\right)\\ \frac{1}{\sqrt{2}} & Cos\left(\theta-\frac{4\pi}{3}\right) & -Sin\left(\theta-\frac{4\pi}{3}\right)\end{bmatrix}. \quad (7)$$

The inverse matrix:

$$[K_\theta]^{-1}=[K_\theta]^t=\begin{bmatrix}\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}}\\ Cos\theta & Cos\left(\theta-\frac{2\pi}{3}\right) & Cos\left(\theta-\frac{4\pi}{3}\right)\\ -Sin\theta & -Sin\left(\theta-\frac{2\pi}{3}\right) & -Sin\left(\theta-\frac{4\pi}{3}\right)\end{bmatrix}. \quad (8)$$

Applying the transformation (6) to the system (1), we have the electrical equations in the d_q reference:

$$[V_d]=[R_s I_{sd}]+\frac{d(\varphi_{sd})}{dt}-\omega_r\varphi_{sq}, \quad (9)$$

$$[V_q]=[R_s I_{sq}]+\frac{d(\varphi_{sq})}{dt}-\omega_r\varphi_{sd}. \quad (10)$$

The flux equation:

$$\varphi_{sd}=L_{sd}i_{sd}+\varphi_f, \quad (11)$$

$$\varphi_{sq}=L_{sq}i_{sq}, \quad (12)$$

ϕ_f is the flux created by the magnets in the rotor. By replacing (11) and (12) and in v_q, v_d we obtain the following equations:

$$V_d=R_s i_{sd}+L_{sd}\frac{di_{sd}}{dt}-\omega_r L_{sq}i_{sq}, \quad (13)$$

$$V_q=R_s i_{sq}+L_{sq}\frac{di_{sq}}{dt}+\omega_r\left(L_{sd}i_{sd}+\varphi_f\right). \quad (14)$$

Equations (13) and (14) form a second order differential equation system that models the electrical behaviour of the synchronous permanent magnet [1], [2].

III. FIELD ORIENTED CONTROL

We can determine the reference torque to impose on the motor and the speed reference from the electromagnetic torque equation expressed in terms of Park's components, if we impose the current. To preserve the torque *Te* proportional to the current *isq*, we must control the angle $\alpha = \pi/2$, and the angle α is determined by the following formula.

A. Inverter modeling

The inverter transforms a DC voltage into an alternating voltage with a varying amplitude and frequency. Its bridge structure is composed mostly of electronic switches such as IGBTs, power transistors or thyristors. Its operating principle is based on controlled switching in a suitable manner (usually a pulse width modulation), the source is modulated to obtain a wanted AC signal frequency. Two types of inverters are used; the voltage inverter and the current inverter. The voltage inverter with six switches, supplied by the photovoltaic generator and operating in pulse-width modulation (PWM) is commonly used for this application in Fig. 2.

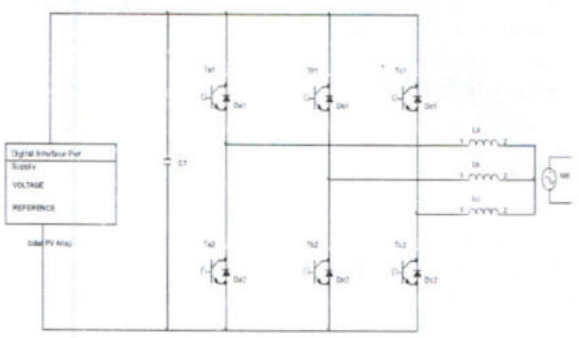

Fig. 2. PMSM supply using voltage inverter.

B. The hysteresis current control technique

It is a simple technique directly interested in current control; it limits the maximum current and is less sensitive to load variations. This method is used to control the current of a to follow a sinusoidal reference current calculated from the currents i_{sdref}, i_{sqref} and from the rotor position ϕ. If the error, which is the difference between the reference current of a phase and the same phase current reached the upper limit $(i_{ref}+\Delta I)$, the switch

arm of the inverter corresponding to the same phase is started and connected to the (-) pole of the power source to reduce the current; while if the error reached the lower limit $(i_{ref} - \Delta I)$, the switch connected to the positive terminal of the power source should be started to increase the flow of the corresponding phase. The lower and upper limits of the hysteresis band ΔI are set by the motor absorbed current and the maximum switching frequency of switches respectively. A narrow band of hysteresis implies a current more similar to the sine wave with a low harmonic content, and a switching frequency higher and higher, and vice versa.

The current references are given by voltage inverter in such to force the phase currents of the motor these currents are sinusoidal functions of rotor position. They create in the gap a field with magnetic axis in quadrature with the axis of the magnets' field. They are in phase with the electromotive forces induced in these windings by the magnets. When the reference current in a phase deviates from its reference, each controller requires switching the switches of each inverter arm and keeps it within the hysteresis band ΔI in Fig. 3.

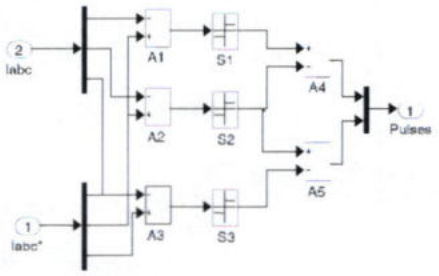

Fig. 3. Representation of hysteresis current control.

C. Modeling of the photovoltaic cell

The photovoltaic generator which produces a continuous electrical current is represented by a standard model with a single diode, established by Shockley for a single PV cell and generalized to a PV module by considering it as a set of identical cells connected in series-parallel [4].

IV. SPEED CONTROLLER DESIGN

The design of the speed controller is important from the point of view of imparting desired transient and steady state characteristics to speed controlled PMSM drive system. A proportional pulse integral controller is sufficient for many industrial applications. Selection of the gain and time constant of such a controller by using the symmetric optimum principle is straightforward if the d axis stator current is assumed to be zero in Fig. 4.

In the presence of a d axis stator current, the d and q current channels are cross couples, and the model is nonlinear, as a result of the torque term [5], [6]. A proportional plus integral (PI) controller is used to process the speed error between the speed reference and filtered speed feedback signals, the transfer function of the speed controller is given as in Fig. 5.

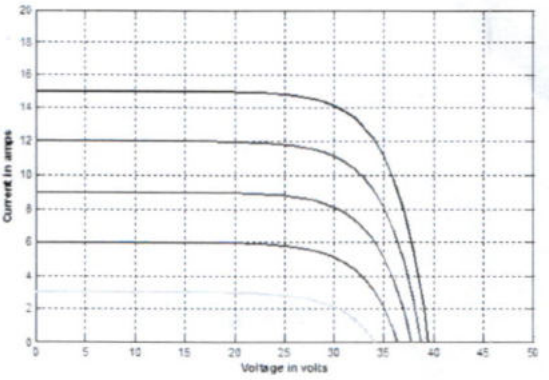

Fig. 4. Characteristics of the power function of the current and the voltage.

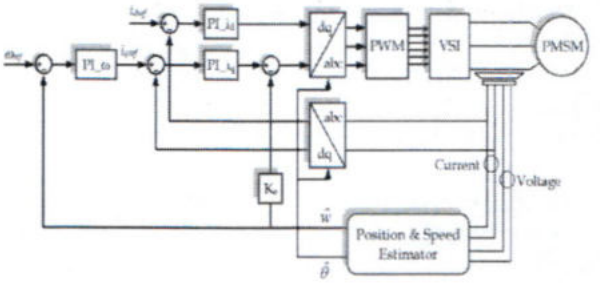

Fig. 5. Block diagram of a speed controlled PMSM drive.

A. Current loop

This induced emf loop crosses the q axis current loop, and it could be simplified by moving the pick-off point for the induced emf loop from speed to current output point. This gives the current loop transfer function in Fig. 6.

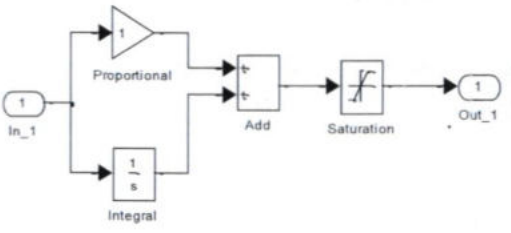

Fig. 6. Implantation the speed controller with saturation in Simulink.

V. LOAD TESTING WITH CONSTANT RESISTANCE TORQUE

The system established in Simulink for a drive system of PMSM with reference current hysteresis control method.

Figures 7-8 shows phase currents of the synchronous motor with permanent magnet. It is clear that the currents are not sinusoidal at startup and becomes sinusoidal when the motor reaches the steady state. The motor absorbs a high current at start-up. i_{dq} currents increase when the motor is controlled by oriented flux, the current i_d is zero ($i_d = 0$), while i_q current increases at start up then stabilizes in steady state. The torque *Te* developed by the motor follows the instructions properly; its value at startup is five times the value of the rated torque.

Steady speed is the same as that of the commanded speed reference (1790 tr/mn). Simulink program of Matlab is used for simulation tests The PMSM parameters used in the tests are as follows: stator Resistance Rs = 1.4 Ω, stator inductance $L_d = L_q = 0.0006$ Henry Magnet flux linkage $\varphi_f = 0.1679$ *Tesla/m*^{2} System inertia J = 0.01176 kgm^2, viscous friction coefficient B = 0.00338818 N.s/rad, DC link voltage using the Lookup Table block in Simulink. We insert the values of the voltage at the PV generator. rated electrical speed ω_n = 1850 tr/mn, pole pairs np = 3 The phase voltages are reconstructed from DC-bus voltage and duty cycle; motor currents are filtered by a three-order low pass filter with pass band edge frequency equal to 12666 rad/s.

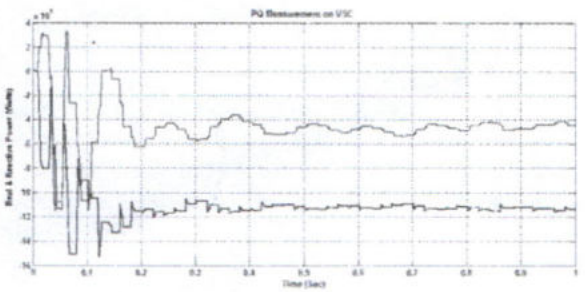

Fig. 7. Diagram of I_{abc} versus time.

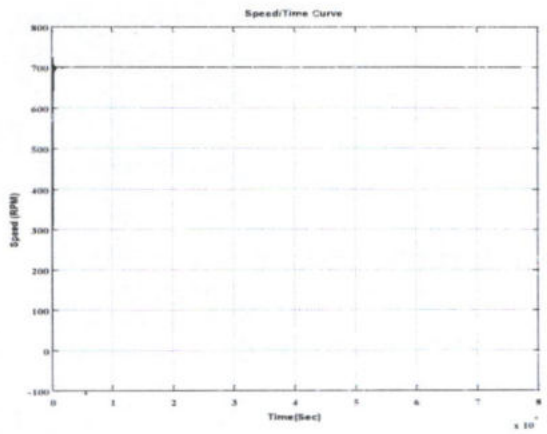

Fig. 8. Diagram of speed versus time.

VI. CONCLUSION

The vector control is introduced in order to control the permanent magnet synchronous machine with maximum power. It is based on a transient model. It allows precise adjustment of the torque of the machine and can ensure torque at zero speed. In this paper, we have presented the principle of the permanent magnet synchronous motor field oriented control, fed by a voltage inverter in the presence of a speed loop with a PI corrector. We can conclude that the field oriented control has a good dynamic and static torque and flux results. View that the radiation and temperature are variable in the day it would be interesting in future work to introduce a buck or boost chopper between the PV generator and the inverter to extract maximum energy delivered by the photovoltaic generator.

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Unstructured Text to DBPEDIA RDF Triples – Entity Extraction

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Abstract:- **In the means of current technologies Use of data, information has grown significantly over the last few years. The information processing facing an issue like where the data is originating from multiple sources in an uncontrolled environment. The reason for the uncontrolled environment is the data gathered beyond the organization and generated by many people working outside the organization. The intent of this paper is delving into this unformatted information and build the framework in such a way that the information becomes more managed and used in the organization. Case and point for resume submitted for particular positions should become searchable. In this framework, we try and solve the problem and provide suggestions on how to solve other similar problem. In this paper, we describe an end-to-end system that automatically extracts RDF triples describing entity relations and properties from unstructured text. This system is based on a pipeline of text processing modules that includes an asemantic parser and a co-reference solver. By using co-reference chains, we group entity actions and properties described in different sentences and convert them into entity triples. We applied our system to over 114,000 Wikipedia articles and we could extract more than 1,000,000 triples. Using an ontology-mapping system that we bootstrapped using existing DBpedia triples, we mapped 189,000extracted triples onto the DBpedia namespace. These extracted entities are available online in the N-Triple format.**

Index Terms — **Framework, Knowledge base, TST, Inverted Index.**

I. INTRODUCTION

By using the structured and semi-structured information from Wikipedia, DBpedia [1] has created very large amounts of linked data and is one the most significant achievements of the Semantic Web initiative. Datasets from DBpedia are used in a wide range of applications such as faceted search, model training for information extraction, etc. DBpedia focuses on extracting structured information from Wikipedia articles, such as info box templates and categorization information. However, the unstructured text of the articles is left unprocessed. Some recent projects have attempted to use this text content to extend the DBpedia triple base. Examples include iPopulator [2] that populates in complete info boxes with attribute values it identifies from the article text, while two recent systems, LODifier [3] and Knowledge Store [4], extract semantic information from the text. LODifier creates RDF triples based on Word Net URIs while Knowledge-Store uses its own ontology. Nonetheless, these systems show limitations in the form of preexisting info box templates or data structures that are not fully compliant with the DBpedia name space.In this paper, we introduce a frame work to carry out an end-to-end extraction ofDBpedia triples from unstructured text. Similarly to LODifier and Knowledge Store, our framework is based on entities and identifies predicate–argument structures usinga generic semantic processing pipeline. However, instead of recreating new semantic structures, we integrate the DBpedia property ontology and therefore make the reuse and extension of the DBpedia dataset much easier. Starting from the DBpedia dataset, we link the triples we extract from the text to the exis ting DBpedia ontology, while going beyond the existing info box templates. Applications already using DBpedia would then benefit from a richer triple store. Related Work. The extraction of relational facts from plain text has long been of interest in information extraction research. The key issue in relation extraction is to balance the trade-off between high precision, recall, and scalability. With the emergence of the Semantic Web and numerous ontologies, data integration has become an additional challenge. There has been a considerable amount of research on semi-supervised [5–7] methods using bootstrapping techniques together with initial seed relations to create extraction patterns. Unsupervised approaches [8, 9] have contributed further improvements by not requiring hand-labeled data.

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These approaches have successfully answered scalability and precision factors, when applied on web-scale corpora. The challenge of ontology and data integration has been addressed by [10].Due to concerns on scaling, the use of syntactic or semantic relation extraction techniques in relation extraction has been relatively sparse. Few systems carry out a complete analysis of the source documents using co-reference resolution or discourse analysis to extract all statements. Exceptions include LODifier [3] and Knowledge-Store [4], that have extracted semantic information and applied co reference resolution. However, the entities extracted by these systems have not been integrated to a single homogenous ontology. In contrast to these approaches, we suggest an end-to-end system, that extracts all the entity relations from plain text and attempts to map the entities onto the DBpedia name space. We balance precision and recall by employing a combination of NLP tools, including semantic parsing, co reference resolution, and named entity linking. Scalability issues are handled by parallelizing the tasks on a cluster of computers. Furthermore, we propose an ontology mapping method that bootstraps learning from existing triples from the DBpedia dataset.

II. SYSTEM ARCHITECTURE

The architecture of our system is a pipeline that takes the Wikipedia articles as input and produces entities in the form of DBpedia RDF triples. As main features, the system includes a generic semantic processing component base on a semantic role labeler (SRL) to discover relations in text, an automatic learning of ontology mappings to link the extracted triples to the DBpedia namespace, and an algorithm to rank named entity

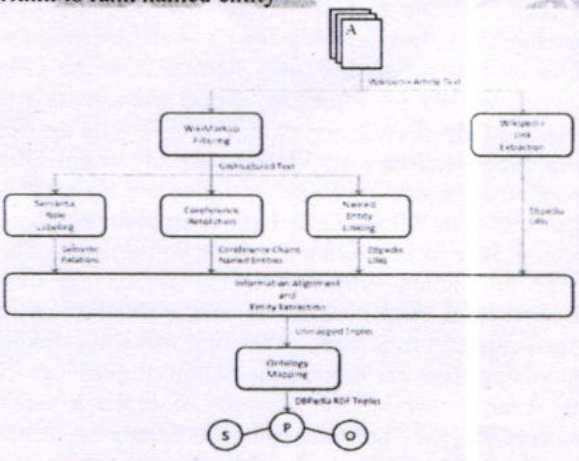

Fig. 1. Overview of the entity extraction pipeline.

links (NEL) found in coreference chains in order to discover representative mentions.

In total, the end-to-end processing of Wikipedia article text consists of seven modules
(Figure 1):

1. A WikiMarkup filtering module that removes theWikimedia markup, providing the plain text of the articles to the subsequent modules;
2. A Wikipedia link extractor that extracts Wikipedia links from the articles;
3. A semantic parsing module, Athena [11], a framework for large-scale semantic parsing of text written in natural language;
4. A coreference resolution module that detects and links coreferring mentions in text;
5. A mention-to-entity linking module that links mentions to a corresponding DBpediaURI;
6. An information aligning and entity extracting module that aligns the output from top-level modules and extracted entities in the form of triples.
7. An ontology mapping module that carries out the final mapping of predicates from thePropbank nomenclature onto the DBpedia namespace.

4 Processing of Wikipedia Article Text WikiMarkup Filtering. Prior to any analysis, the text must be filtered. This is an essential step that seeks to remove annotations and markups without affecting the running text.

Without this step, subsequent modules would fail in their analysis and lead to erroneous extractions. Wikipedia articles are composed of text written in natural language annotated with a special markup called wikitext or wiki markup. It is a simple markup language that allows among other things the annotation of categories, templates, and hyper linking to other Wikipedia articles. Wikipedia also allows the use of common HTML tags. By filteringWikipedia text, weaim at removing all annotations, sections that contain only links and references, and keeping only the running text. This process is difficult since the HTML syntax is often invalid. The most common errors are tags that are leftunclosed or are incorrectly nested.

Wikipedia Link Extraction:
During the Wikipedia link extraction, we extract and preserve the original links along with their corresponding mentions in the article. In addition to extracting the links annotated by the article authors, we make the assumption that the first noun phrase in the first sentence corresponds to the article link. The rationale behind it is that the longest coreference chain in the article often starts with this first mention.The direct correspondence between Wikipedia articles and DBpedia resources allowsus to map Wikipedia links onto their corresponding DBpedia URI by simply adding the DBpedia name space. Semantic Parsing.Frame

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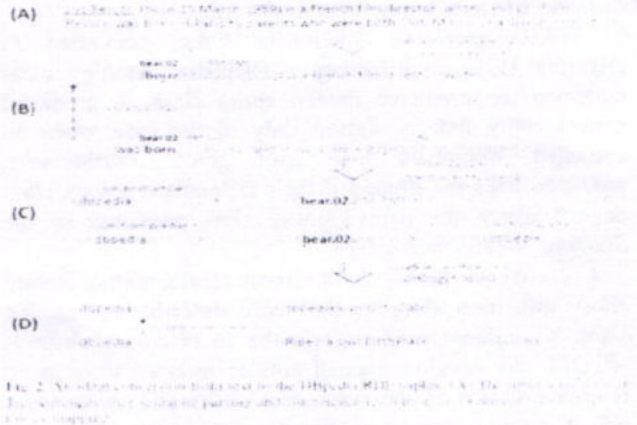
semantics [12] is a linguistic theory that assumes that the meaning of a sentence is represented by a set of predicates and arguments. The Proposition Bank [13] is a project that applied this theory to annotate corpora with predicate argument structures. For each predicate, Propbank identifies up to six possible core arguments denoted A0, A1, ..., and A5 that go beyond the traditional annotation of subjects and objects. Propbank also includes modifiers of predicates, such as temporal and location adjuncts. These roles are instrumental in performing the extraction of entities as they allow the identification of properties containing temporal and locational data with high precision. We use the Athena framework created for parallel semantic parsing of unstructuredtext. At its core, the system uses a high-performance multilingual semantic role labeler that obtained top scores in the CONLL-2009 shared task [14, 15]. Coreference Resolution. A coreference resolver creates chains of coreferring mentions by discovering and linking anaphoric phrases to their antecedents. We used a co reference solver, included in the Stanford CoreNLP package [16, 17], to link mentions of entities in the different parts of text. This allows us to group entity actions and properties described in different sentences. CoreNLP uses a pipeline of tokenizers, partof-speech tagger, named entity recognizer, syntactic parser, and coreference solver to annotate unstructured text. In addition to co reference annotation, we store the named entity classification created by the pipeline. The named entity classes are used to filter named entity links having a conflicting ontology classification.

Named Entity Linking:

An important step in entity extraction is the grounding of named entities to unique identifiers. In most articles, only the first mention of a named entity is annotated with a corresponding Wikipedia link; subsequent mentions are often left unannotated. Wikifier [18] is a named entity linking system that annotates unstructured text with Wikipedia links. By applying Wikifier, we can link unannotated namedentities in the Wikipedia articles to a corresponding DBpedia URI. Ontology Mapping. During semantic parsing, the sentences are annotated with predicate–argument structures called rolesets. As dictionary, the parser uses PropBank that defines more than 7,000 rolesets. Propbank associates each predicate with a set of senses, for instance bear has six senses denoted bear.01, bear.02, ..., bear.06. Finally, each predicate-sense has a set of core arguments that differ with each roleset. For example, bear.02 has two core arguments: A0, the mother, and A1, the child. Considering only the core roles, this amounts to more than 20,000 roles. The objective of ontology mapping is to map the predicate and argument roles from PropBank onto DBpedia properties. We perform this final step to create the DBpedia RDF triples. Figure 2 shows an example of end-to-end processing to DBpedia RDF triples of the sentences: Luc Besson (born 18 March 1959) is a French film director, writer and producer. Besson was born in Paris to parents who were both Club Medscuba diving instructors.



Entity Extraction

The arguments created during semantic parsing are searched in order to find namedentity links corresponding to RDF subjects and objects. This process uses the mentions discovered by the co reference solver, Wikipedia links predicted by Wikifier, and Wikipedia links extracted from the article. In order to keep the task tractable, we have limited the entities to those found in DBpedia and we do not introduce new named entities to the DBpedia ontology. RDF Subjects. PropBank uses the A0 label as the argument describing agents, causers, or experiencers, while arguments labeled as A1 describe entities undergoing a state of change or being affected by an action. In both cases, arguments labeled A0 or A1 can be considered containing RDF subjects and are consequently searched for named entity links. Arguments labeled A0 are searched first, arguments labeled A1 are only searched if a named entity link wasn't discovered in the preceding arguments. RDF Objects. Following the subject extraction, the remaining arguments are examined to discover potential objects. The core arguments and two auxiliary arguments, temporal AM-TMP and location AM-LOC, are searched. The extracted data types can be categorized as following: Named entity links expressed as DBpedia URIs, dates andyears, integers, and strings. We search date expressions in the temporal arguments AMTMP using regular expressions. By using seven common date patterns, we are able to extract a large amount of date and year expressions. We associate the location arguments AM-LOC to named entity links representing places. These links are extracted only if they are classified as dbpedia-owl:Placeby the DBpedia ontology.

Named Entity Link Ranking and Selection. During the search of RDF subject and
objects, we search and select candidate named entity links in the following order:

1. Wikipedia links, converted to DBpedia URIs. We consider named entity links extracted
from the article as being most trustworthy.
2. Wikifier-predicted Wikipedia links, converted to DBpedia URIs, and having a DBpedia ontology class matching the predicted named entity class. A predicted named entity link is chosen only in the case when an extracted Wikipedia link isn't given. Furthermore, predicted links are pruned if their DBpedia ontology class doesn't match the named entity class predicted by the Stanford co reference solver.
3. Co reference mentions; the most representative named entity link (according to the score described in section Using Co reference Chains) in the co reference chain is selected. We consider named entities inferred through co reference chains as the least trustworthy and select them only if an extracted or predicted named entity link is not given. A mention placed in the wrong co reference chain will be considered as an incorrect named entity link; a situation which Wikifier can rectify with higher precision.

Using Co reference Chains. Co reference chains are used to propagate named entity links to arguments having neither an extracted nor a predicted named entity link. This situation arises most commonly for arguments consisting of a single pronoun. Before propagation takes place, we determine the most representative named entity link in the Co reference chain using a ranking and scoring system: – Extracted named entity links are always selected over predicted links. – A score of +2 is given to a named entity link if it has a DBpedia ontology class matching the predicted named entity class.

– The score is increased by the number of tokens of the named entity minus 1.

– If a tie is given between equally scoring named entity links, the link closest to the top of the chain is selected.

We derived the set of scoring rules by performing an empirical examination of coreference
chains. We observed that coreference chains representing people, often started with a mention containing the full name, followed by single-token mentions having only the first or last name. The named entity links of single-token mentions, as predicted by Wikifier, often incorrectly pointed to either a place or a family. By rewarding named entity links having multiple tokens and matching ontology classes, we filtered these incorrect links. Table 1 shows an example, where the mention Robert Alton, a person name, is given the highest score due to matching entity classes and token length. Although the mention Alton refers to the same entity and belongs to the co reference chain, an incorrect named entity link to a city (Alton, Illinois) has been predicted. Given our previous rules, the predicted named entity link is discarded due to a mismatch with the predicted named entity class. The correct named entity link is thus resolved by propagating the link through the co reference chain. Unmapped Triple Generation. Given a set of extracted RDF subjects and objects, we create binary relations from n-ary predicate–argument relations by a combinatorial generation. We discover negative relations by searching the argument roles for AMNEG; these are then discarded.

III. CONCLUSIONS

The framework for unstructured data processing and example case study of resume management system yielded some learning's. We attempt to list some of them here, not in order of importance.

A. Generic Pre-Observations

•Intelligent classification of unstructured data types yields to better processing techniques.

•Common techniques can be exploited for greater benefit if we know in advance as to what kind of information we would be looking at.

•Application building around unstructured data is complex and time consuming task

B. Specific Post Conclusions

•The understanding of data set improves the design quite significantly and yields to better database design. In this particular resume processing was better done because of indexing technique.

•Solutions that work on unstructured data fit in today's web architecture and In very rare cases may need modification to n-tier mode.

•The custom needs to such application can be folded into business logic of web applications.

•XML formatting is important tool that aids for unstructured custom reporting.

•The maximum task in entire work was sent inpresentation logic, which will remain pain point and will need custom work every time.

Experimental Results

The aim of the evaluation is to answer the question of how much information in the form of entity relation triples can be extracted from sentences.We also wish to evaluate the quality of the extracted triples. Since there is no gold standard annotation of entities found in the main text of Wikipedia articles, we performed the evaluation by manually analyzing 200 randomly sampled sentences from different articles. Sampled sentences are examined for relevant subject-predicate-object triples and compared to the correspondingretrieved triples. We computed the precision,

recall, and F1 scores, and in the occurrence of an extraction error, we made a note of the originating source. We evaluated the attributes of each triple in a strict sense: Each extracted attribute must exactly match the corresponding attribute in the sentence. For instance, in evaluating the birthplace of a person, if a sentence states a city as the location, we only consideran extracted DBpedia link to the city as correct. In contrast, if the extracted link refers to a more generalized toponym, such as region or country, we mark the extracted object
as erroneous. In total, we processed 114,895 randomly selected articles amounting to 2,156,574 sentences. The articles were processed in approximately 5 days on a cluster of 10 machines.

Table 3, left, shows the number of processed articles categorized by DBpedia

Ontology classes. From the processed articles, we extracted a total of 1,023,316 triples, of which 189,610 triples were mapped to the DBpedia ontology. The unmapped triples differ in having the predicate localized to the Propbank namespace. In Table 3, right, we can see that from the 189,610 extracted triples, 15,067 triples already exist in the DBpedia dataset. This means that our framework introduced 174,543 new triples to the DBpedia namespace. Almost 3% of the extracted triples are duplicates, the majority of these are triples repeated only once. Since a statement with the same meaning can occur in more than one article, we consider these occurrences natural. In comparing the number of extracted triples to the number of processed sentences, we find that roughly every second sentence yields one extracted triple. In comparison to the number of processed articles, we extracted nearly 9 triples per article. The extracted mapped triples reached a F1 score of 66.3%, a precision of 74.3%, and a recall of 59.9%. The largest source of errors came from predicates, 46.4%, followed by subjects, 27.2%, and objects, 26.4%. Based on post-mortem analysis of the evaluated triples, we find that reasons for the extraction errors can be attributed to the following causes:

– An incorrect mapping from the Propbank predicate-argument roles to the DBpedia ontology properties.
– A new entity is detected, that has previously not been introduced to the DBpedia datasets and therefore lacks a corresponding DBpedia URI.
– The wrong URI is predicted for an entity and cannot be resolved or corrected by the scoring algorithm.
– A mention is placed in the incorrect coreference chain by the coreference solver.

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Underwater Autobot

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Abstract:- **This System is based on making a vehicle that looks exactly like a water animal and can move inside the water exactly like as the water animal does. This type of project is being developed by us to overcome the problem of the naval forces serving deep inside the sea. It reduces the effort of the human and can be controlled through a single server from any place. It uses IoT approach and also a wireless approach if internet is not available and a live feed can be obtained through the project to monitor the places and it is also a cost-effective project one-time implementation project rather than spending on big submarines and Cargo ships. We can take immediate actions after seeing the type of situation. We can also use this project to monitor and examine the underwater activities and to discover new materials down the earth to search for the shipwreck and other materials that go deep inside the ocean and cannot be handled by humans. Later on, this project can be modified to make it an autonomous vehicle using the artificial intelligence so that it can decide itself to take actions. Whenever possible human can take control of it as soon as the situation comes to handle it.**

***Keywords*---** **IoT, Monitor, Wireless, Autonomous.**

I. INTRODUCTION

Marine autonomous systems, including submarine gliders and Autonomous Underwater Vehicles, are revolutionizing our ability to map and monitor the marine environment. Although truly autonomous systems are typically deployed from a research vessel, they are not tethered to the vessel and do not require direct human control while collecting data. They therefore provide opportunities for data acquisition in parts of the ocean previously inaccessible to vessel-based instruments, e.g. beneath ice sheets in polar regions, and are improving the spatial and temporal resolutions of a broad spectrum of marine measurements. Marine autonomous systems also have an increasing range of applications in the defense, industry and policy sectors, such as geohazard assessment associated with oil and gas infrastructure. In addition, recent economic drivers, such as rapidly increasing vessel fuel oil costs, are making autonomous systems a potentially attractive proposition to organizations responsible for large-scale and cost-effective marine data collection program.

This contribution will focus on Autonomous Underwater Vehicles, as these platforms are most relevant to geoscience studies that are targeted at or close to the interface between the seabed and the water column. This is a critical interface, as it is a key physical habitat for benthic organisms as well as a zone of focused sediment transport and deposition. The ability to collect high-resolution data from this interface is essential, but technologically challenging (especially in deep water). The aims of this paper are to i) provide an introduction to Autonomous Underwater Vehicles and their capabilities, ii) present an overview of their applications in marine geoscience (based upon peer-reviewed scientific literature and new data collected by the authors), and iii) discuss potential future applications and technological advances.

AUTONOMOUS UNDERWATER VEHICLE

Autonomous Underwater Vehicles (AUVs) are unmanned, self-propelled vehicles that are typically deployed from a surface vessel, and can operate independently of that vessel for periods of a few hours to several days. Most are torpedo-shaped, but some have a more complex configuration allowing them to move more slowly and across complex terrain. AUVs follow a pre-programmed course and are able to navigate using i) arrays of acoustic beacons on the seafloor (Long Base Line), or ii) a combination of Ultra Short Base Line acoustic communication, GPS positioning, and inertial navigation (when below the surface — based on dead reckoning using a combination of depth sensors, inertial sensors and Doppler velocity sensors). Unlike submarine gliders, which are propelled using a buoyancy engine and have an undulating trajectory, AUVs are able to maintain a direct (linear) trajectory through the water and are therefore well suited to geoscience applications requiring constant altitude, such as seabed mapping and sub bottom profiling. Remotely Operated Vehicles (ROVs) remain tethered to the host vessel and, while this enables them to draw more power and communicate real-time data, their

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speed, mobility and spatial range are very limited compared with an AUV. The wholly autonomous nature of some AUVs means that the deploying vessel can be used for other tasks (sometimes geographically separate from the AUV work area) while the AUV is in the water, dramatically increasing the amount of data that can be collected for a given amount of ship-time. Depending on their pressure resistance, existing AUVs for scientific research can operate in water depths (WD) of up to 6000 m. The ability of deep-water AUVs to fly relatively close to the seabed (< 5 m altitude in areas of low relief) means they are potentially capable of collecting seafloor mapping, profiling and imaging data of far higher spatial resolution (up to two orders of magnitude) and navigational accuracy than surface vessels and towed instruments, which include side scan sonar and camera systems. AUVs therefore effectively bridge the spatial resolution gap between vessel-mounted or towed systems, e.g. multibeam echo sounders (MBESs), sides can sonars (SSSs) and sub bottom profilers (SBPs), and ROV-mounted systems. In many cases, AUVs are actually used in conjunction with these systems as part of a 'nested' multi-resolution survey of the seafloor, with i) vessel-mounted MBES or 3D seismic initially providing a regional base map with a spatial resolution of 10s to 100s of meters, ii) AUV MBES providing detailed maps with a spatial resolution of 0.5–5 m, and iii) ROV imaging and sediment sampling subsequently targeting seafloor features as small as a few cm. AUVs are capable of carrying a variety of sensor payloads relevant to marine geoscience, including geophysical instruments (MBES, SBP, SSS, magnetometer), geochemical instruments (electrochemical redox sensors), seafloor-imaging tools (high-definition monochrome or color cameras) and oceanographic instruments (CTD, Acoustic Doppler Current Profilers (ADCPs)). The sensors deployed determine the vehicle altitude, as well as its speed and endurance. Higher power sensors, e.g. SSS and SBP, reduce endurance due to their increased energy requirements, while high-resolution seafloor imaging with a color camera system will require the AUV to fly slower and closer to the seabed than if it was undertaking a MBES survey. The ability of AUVs to continuously collect large volumes of data during multiple missions also introduces new challenges in terms of data analysis and storage.

AUVs cannot operate everywhere, and certain factors need to be taken into account during mission planning. AUVs used in marine geoscience typically move at speeds of up to 1.5–2.0 m/s− 1, and can be influenced by tidal (or other) currents approaching or exceeding these velocities (negative impacts include 'crabbing' of the vehicle and navigational drift, both of which can significantly affect data quality). AUVs may also be less well suited for deployment in areas of high military, shipping or fishing activity, due to acoustic interference, collision risk, and net entanglement. Areas of high water-column turbidity, e.g. phytoplankton blooms or areas of high fluvial run-off, may hinder camera-based seafloor imaging. Although relatively 'quiet' compared to research vessels, AUVs may disturb marine fauna in sensitive regions, e.g. Marine Protected Areas, especially when running acoustically loud geophysical sensors. Although many of these external factors also affect research vessels, AUVs are generally less well suited to tidally dominated shallow-water settings that have high levels of anthropogenic infrastructure and activity.

II. LITERATURE REVIEW

In the past 20 years, the AUV design has been modified appreciably as per our need. It includes torpedoshapes, laminar flow bodies, streamlined rectangular styles, multihull design etc. The basic need of AUV is forhydro graphic purposes. The laminar flow body achieves low drag by maintaining laminar flow over most of itslength by virtue of its bulbous shape. Most early AUVs were designed with a cruising speed of around two metersper second. It is probably true to say that most have fallen short of achieving the combination of design speed andrange. This has occurred for a variety of reasons. For instance, increased drag associated with antennae, lifting lugsand sensor protrusions, among other things, may have been glossed over, and the build is often heavier thananticipated which is invariably overcome by carrying less energy (batteries). In addition, the propulsion efficiencymay be less than hoped for due to poorly designed or matched propellers, and the battery energy density can be lessthan expected due to cold temperatures, high current drain or incomplete manufacturer's data. Many of these pasterrors (often due optimism) can be easily corrected in a new analysis, but the effect of the shape and vehicleappendages on the hydrodynamic drag is harder to asses and has a significant impact on the performance of anAUV.Most early AUVs were designed to compromise with speed as they need long endurance where the averagecruising speed of the vessel was of around 1.5 to 2 meter per second. Then designers always faced problem to get abetter combination of endurance and speed. It was due to more drag appendages, heavier weight than estimation,lifting lugs and sensor protrusion, less propulsion efficiency due to poorly designed or matched propellers, reducedbattery performance due to

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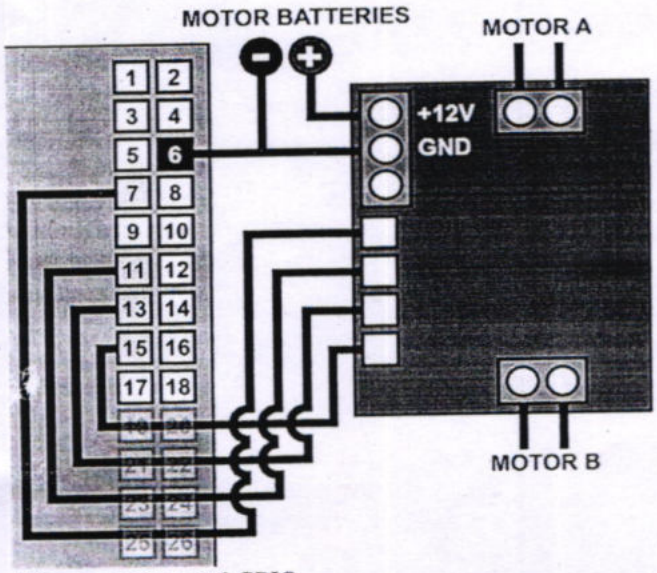
cold temperature, high current drain or incomplete manufacturer's data. Today the
advancement has been brought mainly in the following areas:

- Autonomy
- Energy
- Navigation & communication
- Sensors
- Biomimetic AUV

III. IMPLEMENTATION




```
# import curses and GPIO
import curses
import RPi.GPIO as GPIO

#set GPIO numbering mode and define output pins
GPIO.setmode(GPIO.BOARD)
GPIO.setup(7,GPIO.OUT)
GPIO.setup(11,GPIO.OUT)
GPIO.setup(13,GPIO.OUT)
GPIO.setup(15,GPIO.OUT)

# Get the curses window, turn off echoing of keyboard to
screen, turn on
# instant (no waiting) key response, and use special values
for cursor keys
screen = curses.initscr()
curses.noecho()
curses.cbreak()
screen.keypad(True)
try:
    while True:
        char = screen.getch()
        if char == ord('q'):
            break
elif char == curses.KEY_UP:
GPIO.output(7,False)
GPIO.output(11,True)
GPIO.output(13,False)
GPIO.output(15,True)
elif char == curses.KEY_DOWN:
GPIO.output(7,True)
GPIO.output(11,False)
GPIO.output(13,True)
GPIO.output(15,False)
elif char == curses.KEY_RIGHT:
GPIO.output(7,True)
GPIO.output(11,False)
GPIO.output(13,False)
GPIO.output(15,True)
elif char == curses.KEY_LEFT:
GPIO.output(7,False)
GPIO.output(11,True)
GPIO.output(13,True)
GPIO.output(15,False)
elif char == 10:
GPIO.output(7,False)
GPIO.output(11,False)
GPIO.output(13,False)
GPIO.output(15,False)

finally:
   #Close down curses properly, inc turn echo back on!
curses.nocbreak(); screen.keypad(0); curses.echo()
curses.endwin()
GPIO.cleanup()
```

III. CONCLUSION

AUV has traced a remarkable path in the advancement of technology and its performance. In recent years AUV has utilized many technologies from different fields. No doubt in coming days AUV technology is going to commercialize the market and its production. The only trend that can be seen now is the two paths that the marketplace has established. The first is the development of small, low cost AUVs. It is envisioned that these systems can eventually be used in groups of cooperating vehicles. The second type of AUVs are much more advance compact with high endurance capability and mission specific and better propulsive performance. These are not low cost systems but they are able to undertake tasks that, if done in other ways, would be

far more expensive to accomplish. This has been led to look into the Bio Inspired AUVs. It will be interesting to watch the evolution of these two trends in AUV development. And still the advancement is consistent and continuous by the tremendous effort of researchers, scientists and engineers. Apart from technologies, autonomy is probably the most important issue to be addressed but others, such as those described above, certainly must be addressed. It is clear that the limit to the capability of any AUV is the amount of energy it has onboard until there is no alternative source of energy like solar. There have been many discussions that suggest that biomimetics are the future of and new incarnation of AUVs. So, we have to observe the nature, get inspired and model it artificially. The increase in endurance will be substantial. There is a need to find out the alternative way of underwater propulsion. In this regard variable buoyancy concept is a boon. It's the time to extend the constraints of undersea glider, which could be done by the way we have already suggested. AUV systems are at a transition point. They are moving from the Science and Technology communities into the commercial marketplace.

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Traffic Control in 4G Technology through Iterative Server

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Abstract: **- As mobile communication has developed rapidly.The increasing dependency of people on telecommunication resources is pushing the present technological developments in the mobile world. In Real-time multimedia applications, such as Live Television or live movie, video conferencing, VoIP, online gaming etc., are exciting applications to the success of 4G.In today's Internet these applications are not subject to traffic control, therefore the growth of popularity of these applications may risk the stability of the Internet. In this paper, we present a novel model to solve the network traffic problem through the iterative server. In this model, when a client sends a request to server then server will generate an individual iterative server for requesting client. After completing the request, the iterative server will be automatically be destroyed.**

Keywords--- **Iterative Server, Traffic Control, iterative server.**

I. INTRODUCTION

1.1 First Generation (IG)

Mobile networks were deployed in late 1970's and early 1980's, being a wholly analogue network, providing voice calls. Some of the most successful 1G system is Nordic Mobile Telephone (NMT) System and Advance Mobile Phone System (AMPS) [1].

I) Nordic Mobile Telephone (NMT) System: This system was developed in Europe in 1981. The two variants of NMT are: NMT-450 and NMT-900. The numbers indicate the frequency bands uses. NMT-900 was introduced in 1986 because it carries more channels than the previous NMT-450 network.

II) Advance Mobile Phone System (AMPS): This system was developed by U.S. Federal Communications commission in 1983 and allocated 666 duplex channels with 40 MHZ of spectrum in the 800 MHZ band and each channel have a one way bandwidth of 30 KHZ for each duplex channel for the U.S. AMPS.

1.2 Second Generation (2G)

Mobile networks was superseded in the 1990s, (GSM, initially Group Special Mobile later changing name to Global System for Mobile Communications) which being digital along with voice it introduced everyone to text messaging (SMS, Short Message Service). 2G technologies can be divided into TDMA-based and CDMA based standards depending on the type of multiplexing used [2] [3]. The main 2G standards are:

I) GSM (TDMA-based), originally from Europe but used in almost all countries on all six inhabited continents. Today, it accounts for over 80% of all subscribers around the world. Over 60 GSM operators are also using CDMA2000 in the 450 MHz frequency band (CDMA450).

II) IS-95 aka cdma One (CDMA-based, commonly referred as simply CDMA in the US), used in the Americas and parts of Asia. Today, it accounts for about 17% of all subscribers globally. Over a dozen CDMA operators have migrated to GSM.

III)PDC (TDMA-based), used exclusively in Japan.

IV) iDEN (TDMA-based), proprietary network used by Nextel in the US and Tel us Mobility in Canada.

V) IS-136 aka D-AMPS (TDMA-based, commonly referred as simply 'TDMA' in the US), was once prevalent in the Americas but most have migrated to GSM.

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1.3 Second and a half Generation (2.5G)

2.5G is used to describe 2G-systems that have implemented a packet-switched domain in addition to the circuit-switched domain. It does not necessarily provide faster services because bundling of timeslots is used for circuit-switched data services (HSCSD) as well. The first major step in the evolution of GSM networks to 3G occurred with the introduction of General Packet Radio Service (GPRS). CDMA2000 networks similarly evolved through the introduction of 1x1RTT.
The combination of these capabilities came to be known as 2.5G.

1.4 Third generation (3G)

Mobile telecommunication is a generation of standards for mobile phones and mobile telecommunication Services full fill the International Mobile Telecommunications-2000 (IMT-2000) specifications by the International telecommunication Union. Application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment [3] [4]. To meet the IMT-2000 standards, a system is required to provide peak data rates of at least 200 k bit/s (about 0.2 M bit/s).

The following standards are typically branded 3G:

I) the UMTS system, first offered in 2001, standardized by 3GPP, used primarily in Europe, Japan, China (however with a different radio interface) and other regions predominated by GSM 2G system infrastructure. The cell phones are typically UMTS and GSM hybrids. Several radio interfaces are offered, sharing the same infrastructure:

II) The original and most widespread radio interface is called W-CDMA.

III) The TD-SCDMA radio interface was commercialized in 2009 and is only offered in China.

IV) The latest UMTS release, HSPA+, can provide peak data rates up to 56 Mbit/s in the downlink in theory (28 Mbit/s in existing services) and 22 Mbit/s in the uplink.

V) The CDMA2000 system, first offered in 2002, standardized by 3GPP2, used especially in North America and South Korea, sharing infrastructure with the IS-95 2G standard. The cell phones are typically CDMA2000 and IS-95 hybrids. The latest release EVDO Rev B offers peak rates of 14.7 Mbit/s downstream, see figure 1.

Limitations of 3G:

1. It is difficult to extend to higher data rate in CDMA.

2. It is difficult to provide a full range of multi-rate services and not a fully integrated System.

3. There is also a propagation problem in CDMA; it may not work in a multi path systems from private to public and indoor to wide area [4] [5].

II. RELATED WORKS

Sneha Kumar Kasera et al. [6] proposed three congestion control mechanisms are admission control, diversity control, and router control, to maximize network capacity while maintaining good voice quality. They first Proposed two new enhancements to CDMA call admission control that consider a unified view of both IP RAN and air interface resources. Next, they introduced a novel technique called diversity control that exploits the soft-handoff feature of CDMA networks and drops selected frames belonging to multiple soft-handoff legs to gracefully degrade voice quality during congestion. Byeong Kil Lee et al. [7] analyzed the characteristics of representative congestion control applications— scheduling and queue management algorithms, and proposed application-specific acceleration techniques that use instruction-level parallelism (ILP) and packet-level parallelism (PLP) in these applications. From the PLP perspective, proposed a hardware acceleration model based on detailed analysis of congestion control applications. In addition with get large throughputs, a large number of processing elements (PEs) and a parallel comparator are designed. Such Hardware accelerators provide large parallelism proportional to the number of processing elements added. A 32-PE enhancement yields 24 speedup for weighted fair queuing (WFQ) and 27 speedup for random early detection (RED). For ILP, new instructions set extensions for fast conditional operations are applied for congestion control applications. Ken Burst et al. [8] explored an alternative to reservations based admission control called Delay Based Congestion Detection and Admission Control (DB a form of Endpoint Admission Control) is a method for edge devices, such as media gateways, to detect impending congestion in the core based on delay measurements and analysis. When impending congestion is detected, the edge devices refuse new incoming connections to the media gateways. To mitigate the congestion, this research examines the characteristics of AC and finds that AC is a promising alternative to a

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3.1 Advanced Features of 4G Technology

1. Wider mobile coverage area
2. Smoother quicker handoff.
3. Broader bandwidth - higher data rates
4. WLAN for hot spots, an extension of 2G and 3G.
5. Terminal Heterogeneity and Network Heterogeneity.
6. Global roaming and inter-working between different access technologies.
7. Better scheduling and call admission control techniques.
8. User Friendliness and User Personalization.
9. Support interactive multimedia, voice, video, wireless Internet and other broadband services [10].

3.2 Protocols & Modulation:

Internet Protocol version 6 (IPv6) is considered to be the evolved IP protocol for mobile systems providing:

1. Enhanced address space
2. Security
3. Extension headers

3.3 Session Initiation Protocol (SIP)

It has a flexible structure and can be easily extended. Therefore, it plays a role of true multimedia protocol that controls and transports:

1. Emails 2. Pictures
3. WEB links 4.Videos Service scripts
5. Speech 6. Multiparty sessions

3.4 Wideband Code Division Multiple Accesses (WCDMA)

It is a wideband direct sequence CDMA system. User information bits are spread over a wide bandwidth by multiplexing. The high data bit rates (2Mbps) can be support by use the variables Spreading factor and Multicode Connection. The Most important feature of WCDMA is Power Control, Particularly on uplink [11].

IV. 4G WORKING

When users send request to main server then server allot the free port to users. If port is not free then network is congested because users' request in wait state, see figure 2.

If Np = Ci then network is normal.
If Np > Ci then ports are not free and network is congested.

Pseudo Code:
Step 1: Ms=Main Server, Sp=Server Port, Client= C;
Step 2: Ci=Ms (Client request to server)
If (Sp==Available)
Then assign port to Client;
Else if
Server port is busy wait;
Else
Server cannot Connected, server is unavailable

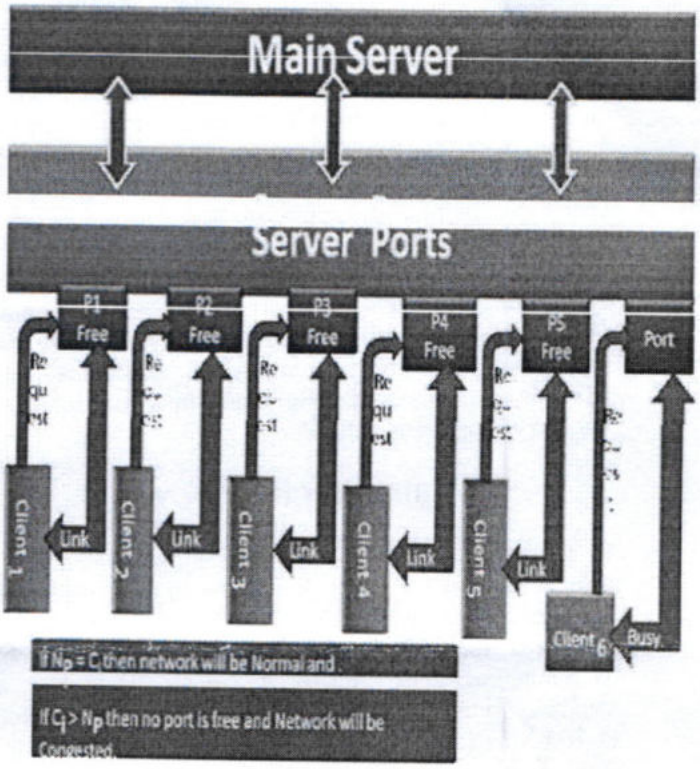

Fig. 2 4G Architecture

Step 3: for Ci=Np; i.e. if [no of client request is = no of port];
For (Ci=1; Ci<=Np; Ci++)
Assign Np = Ci;
Step 4: Repeat while (Np>=Ci);
Step 5: End;

V. PROPOSED WORK

The purposed model is depending on the iterative server mechanism. When any client will send any request then the client listener module will listen the client request and then it will send notification to the main sever about the requested client, then the main server will instruct to the client listener and client listener will generate new temporary server for the requested client which is known as the iterative server.

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reservation based admission control approach for enterprise or carrier controlled IP Networks. Chung-Ju Chang et al. [9] proposed congestion control using fuzzy/neural techniques for integrated voice and data direct-sequence code division multiple access/frame reservation multiple access (DS-CDMA/FRMA) cellular networks. The fuzzy/neural congestion controller is constituted by a pipeline recurrent neural network (PRNN) interference predictor, a fuzzy performance indicator, and a fuzzy/neural access probability controller. It regulates traffic input to the integrated voice and data DS-CDMA/FRMA cellular system by determining proper access probabilities for users so that congestion can be avoided and throughput can be maximized. Simulation results show that the DS-CDMA/FRMA fuzzy/neural congestion controllers perform better than conventional DS-CDMA/PRMA With channel access function in voice packet dropping ratio, corruption ratio, and utilization. In addition with, the neural congestion controller outperforms the fuzzy congestion controller.

III. 4G TECHNOLOGY

In telecommunications, 4G is the fourth generation of cellular wireless standards. It is a successor to the 3G and 2G families of standards. In 2009, the ITU-R organization specified the IMT-Advanced (International Mobile Telecommunications Advanced) requirements for 4G standards, setting peak speed requirements for 4G service at 100 Mbit/s for high mobility communication (such as from trains and cars) and 1 Gbit/s for low mobility communication (such as pedestrians and stationary users)[8] [9].

A 4G system is expected to provide a comprehensive and secure all-IP based mobile broadband solution to laptop, computer, wireless modems, smart phones, and other mobile devices. Facilities such as ultra-broadband Internet access, IP telephony, gaming services, and streamed multimedia may be provided to users. IMT-Advanced compliant versions of LTE and WiMAX are under development and called "LTE-Advanced" and "Wireless MAN-Advanced" respectively. ITU has decided that LTE Advanced and Wireless MAN-Advanced should be accorded the official designation of IMT-Advanced. On December 6, 2010, ITU recognized that current versions of LTE, WiMAX and other evolved 3G technologies that do not fulfil "IMT-Advanced" requirements could nevertheless be considered "4G", provided they represent forerunners to IMT-Advanced and "a substantial level of improvement in performance and capabilities with respect to the initial third generation systems now deployed". 4G mobile communication system is based on full IP network. It has load mechanism based on IP & network maintenance and management & control of network source based on IP. Core network is independent of concrete wireless access network and it can supply end-to-end IP service and can be compatible with current core network and PSTN. Core network is open structure and it has three properties; service, control and transport. These properties will be different from 3G properties [4] [10].

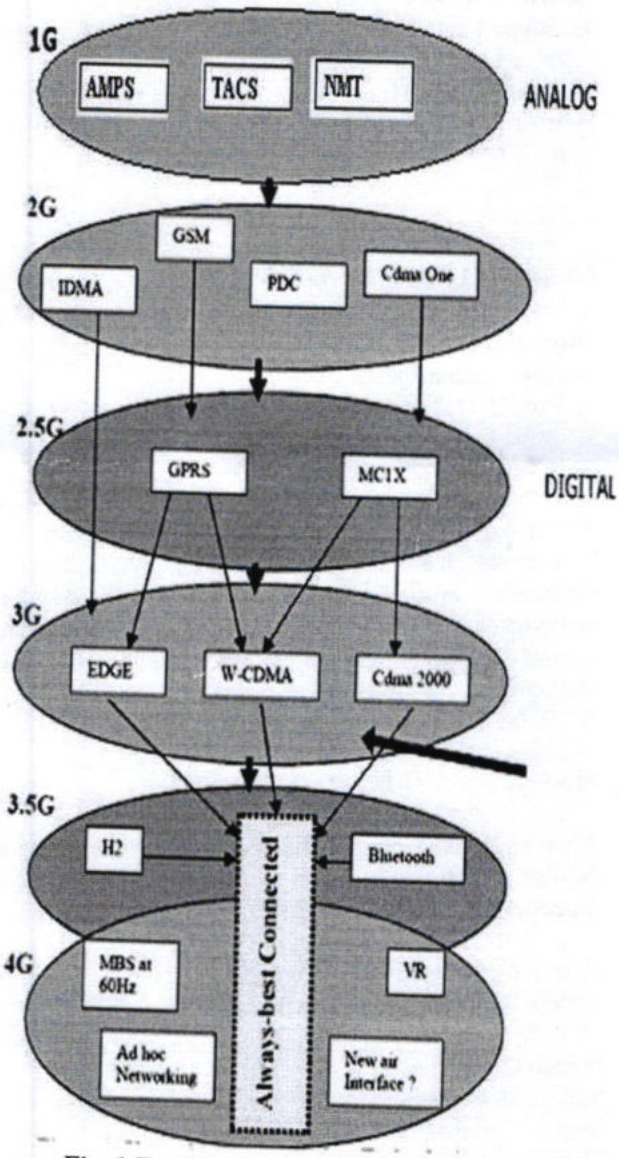

Fig. 1 Evolution of Wireless Technology

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The idea behind proposed model is that when any client will send his request for connecting to the server then the client request will be listen by the client listener and the client listener will send a request to the main server. The main server will generate an iterative server for the requested client. As the client will complete his task then this server will be automatically destroyed. So by using this policy, network congestion can be avoided because there is no waiting policy is used as we are using in current technology, see figure 3.

Iterative server: A server that listen only one client request at a time.

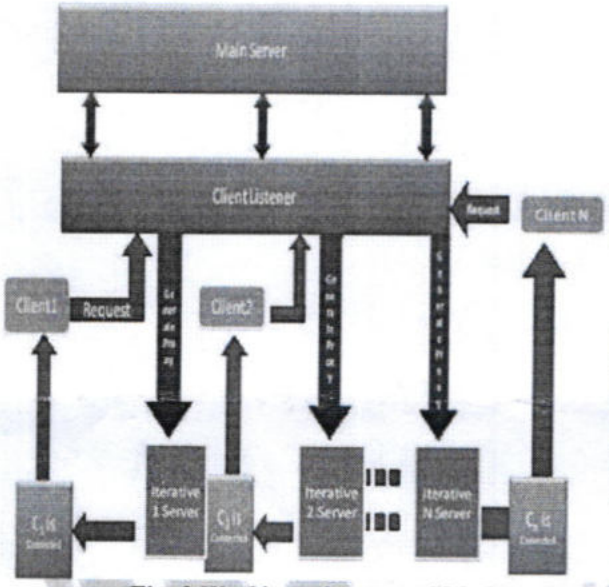

Fig. 3 Working of Proposed Model

{

Read a client request perform requested action send a reply

}

Close the client socket

}

Close the passive socket

VI. CONCLUSION & FUTURE WORK

Mobile communication is very exciting technology in today time for communication and internet access. As the mobile technology has grown exponentially in future, the user will be totally depend on the mobile. So due to this reason, we have required such kind of technology so that a user can be easily use it as much as possible. The problem raised in today time of network congestion when accessing the internet. So, our future work will be implementing to mitigate the congestion control and accessing speed of the internet via mobile should be very fast and there will not be any congestion situation arises while accessing data from WWW on Internet.

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Traffic Congestion Reduction, Automatic Accident Detection and Ambulance Rescue Alerts using Smartphone and WSN.

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Abstract: **- Number of vehicles in our country has exponentially increased but the traffic control systems have not developed in that phase. Therefore it is the time to shift from fixed timer mode to an automatic system. In this paper, we are proposing a traffic congestion reduction system and an automatic ambulance rescue alert system. Taking into account that user is using smartphones with an internet connection. There is a good opportunity to put forth our architecture for WSN using Smartphones. This also aims at finding the place or location of the accident and reporting the location of the accident to the nearest ambulance. The vehicle's position in the form of latitude and longitude coordinates will be sent to road transport officials through the internet. The location spot is retrieved using "GLOBAL POSITIONING SYSTEM". This technology also helps to inform about the accident to nearby hospital/ambulance service immediately.**

Keywords**--- Wireless sensor, smartphones, GPS and GSM.**

I. INTRODUCTION

Over the last century transport field has evolved to become a driving force for the global economy. To address the challenges congestion traffic in a city, to the environmental concerns, and to security and safety. Smartphone is one of the dynamic trends in communication. Each device node contains: sensor, processor, memory, radio and approach for congestion traffic detection. The main motivation behind our technical paper is to control traffic congestion. On the other hand, we also make the consideration for the energy efficient based on the interoperability between the WSN and smart phones of the citizen existing on street. One approach to eliminating the delay between accident occurrence and first responder dispatch is to use in-vechicle automatic accident detection and notification systems, which sense when traffic accidents occur and immediately notify emergency personnel. This technical paper aims at finding the occurrence of accidents and reporting the location through traffic signal and the ambulance reach the traffic signal and the ambulance driver controls the signal. This technical paper provides the result by smartphone accident detection system to prevent false positives. 2.

II. RELATED WORKS

Al Sobky et.al.[1] Introduced new application for using smart phones to measure traffic density and speed. The proposed system consists of two smart phones and two cars, with observer to count vehicles between the two cars. This count is utilized with tracking data to give "measured" density and "measured" speed. The travel speed and manual traffic counts were used to derive "calculated" density. Yi Sheng Huang et.al.[2] Proposed a solution to regulate the problem of traffic congestion. For this purpose, their paper presents a dynamic control methodology is constructed by the alternation of PIC and ROC sub-models. The two sub-models are successful in describing the dynamic situation. That is the GS can turn off to forbid incoming vechicles. And the GS can turn on when the traffic congestion is released. Calderoni et.al.[3] In this infrastructure it consist of a network of smart cameras operating over a outdoor public lighting thanks to power line communication technology and equipped with a vehicle counting and classification algorithm.

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III. FIELD APPLICATION OF SMARTPHONE

The present study reviewed the literature related to factors. The smart phone sensing has grown; the range of applications has expanded as follows:

Traffic Sensing Detection:

We focused on the developed world. with its relatively simple traffic flow patterns. In fact, traffic flow in cities of the developing regions, which comprise much of the world, tends to be much more complex owing to varied road conditions. For example: Monitor in real time the number of vehicles passing for a certain point in highways and roads and detect average time of vehicle stance for traffic congestion prevention. The monitoring system can also be used to calculate the average speed of the vehicles which transit over a roadway by taking the time mark at two different points, etc. The Vehicle Traffic Monitoring is also another important application as understanding the flow and congestion of vehicular traffic is essential for efficient road systems in cities. Smooth vehicle flows reduce journey times, reduce emissions and save energy. Similarly the efficient flow of pedestrians in an airport, stadium or shopping Centre saves time and can make the difference between a good and a bad visit. Monitoring traffic - whether road vehicles or people - is useful for operators of roads, attractions and transport hubs.

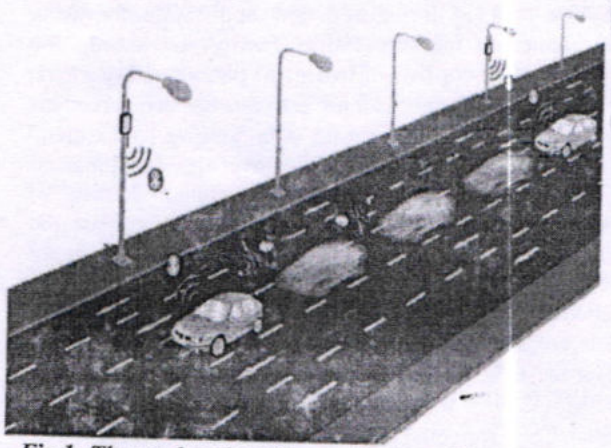

Fig 1: The road and traffic monitoring with WSN and Smartphone

IV. PROPOSED SYSTEM

The proposed system consists of three modules.

1. Traffic congestion reduction module
2. Automatic Accident Detection and localization
3. Ambulance Rescue

4.1. Traffic Congestion Reduction

Interfacing between Smartphone and wireless node: In this section, the smart phone is connected with the WSN by a sink or gateway node. This architecture solution exploits a single gateway, i.e. the smart phone (see Figure 2).

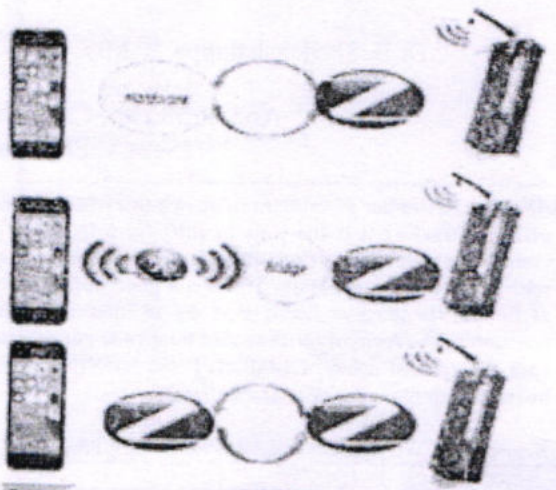

Fig 2: Interoperability between a wireless node and a smart phone

We will focus on the solutions based on: base station and overlay networks also considering possible improvements . The radio communication device will be equipped with two radio interfaces: Interface ZigBee for WSN and interface TCP/IP or ZigBee for smart phone communication direct. The system is proposed on two levels; hardware and software. At the hardware level, heterogeneous sensors are deployed for multi-activity and multi-events, these wireless nodes are configured with ZigBee Mesh topology and data is received by central coordinator node and collected by local home gateway computer or server[5]. The software modules are subdivided into different levels, such as data logging, data extraction, and data storage, in our models the data entry by Bluetooth or by WIFI. But their ultimate task is to forecast the change in activity and correlate it with the wellness of inhabitants in real time or near time. The software components installed on the smart phones including, the sensing Daemon, which is responsible for sensing, classification, data processing (e.g., privacy preserving audio processing) and uploading of sensor data, etc.

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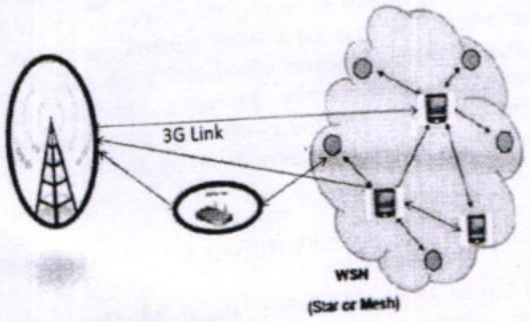

Fig 3: WSN for traffic monitoring

But such configurations bring a number of issues, such as how to detect paths to the Internet, which path to use, and how to redirect traffic from one path to another.

4.2. Automatic Accident Detection:

In proposed system if a vehicle has met with an accident, immediately an alert message with the location coordinates is sent to the control centre. From the control centre, a message is sent to nearby ambulance. Also signal is transmitted to all the signals in between ambulance and vehicle location to provide RF communication between ambulance and traffic section. The vehicle accident observed using vibration sensor and in the control section it is received by the micro controller and then the nearby ambulance is received from the PC and controller sends the message to the ambulance. The signal to the traffic signal section is transmitted through RF communication. Also if any fire occurs it is detected using fire sensors and an alarm message is directly sent to the fire station

Vibration Sensor [4]:

According to our system, every vehicle should have a vehicle unit. The vehicle unit consists of a vibration sensor, Microcontroller, a user interface, GPS system and a GSM module. There is need to process the low level voltage signal properly given by vibration sensor. We can use multiple sensors for detection of accident to avoid any error in detection. These sensors can be installed in vehicle body at most vibration sensitive locations. A central system can be implemented inside vehicle to process the signal coming from sensors and to detect the accident from the signals coming from multiple sensors.

The predefined data i.e. Peak voltage level or crash waveform data are used to decide whether an accident is occurred or not. The vibration sensor used in the vehicle will continuously sense for any large scale vibration in the vehicle. The sensed data is given to the controller GPS SYSTEM inside the vehicle. The GPS SYSTEM finds out the current position of the vehicle (latitude and the longitude) which is the location of the accident spot and gives that data to the GSM MODULE. The GSM MODULE sends this data to the control unit whose GSM number is already there in the module as an emergency number. We can also use this vehicle unit for health monitoring of the patient using different sensors.

GPS

GPS (Global Positioning System) It stands for "Global positioning system". It is having 24 satellites it will transmit the coded information. These 24 satellites will rotate one time over the earth in every 12 hours. In order to provide the information about velocity, time etc… GPS will help us identify the distance between the two different places on the earth and it will show the route to reach the required destination. Figure 2 shows the GPS module. There are three different segments in GPS they are: 1) Space segment 2) Control segment 3) User segment When satellites transmit information and each satellite will have a different code and it also transmit information at different frequencies so that the GPS can discriminate with the different signal received by the different satellites. This condition will help to calculate the time taken to travel the distance between the satellite and the GPS receivers and then the travel time is multiplied by the light speed gives the distance between the satellite and the GPS receiver The control segment will identify the satellite and it will guide with the proper orbit and proper time taken by the satellite to reach the GPS.

It is having four unmanned station with single master control station. These unmanned stations will receive the information from different satellites and this information is send to the master station and this is send to the GPS satellite. The user segments consist of users and the GPS receivers. Working of GPS: When a GPS receiver is started to work, firstly it will start to download the orbit information about each and every satellite to download this information it will take around 12.5 min once this information is completely downloaded it will be stored in the receivers in order to use further. The GPS knows the exact location of the satellite but still it needs to know the exact distance between the satellite and the receiver. This distance can be calculated by the receiver, by multiplying the time taken by the signal to reach the receiver and the velocity of the transmitted signal. But the receiver already knows the velocity which is 18600 miles/ sec.

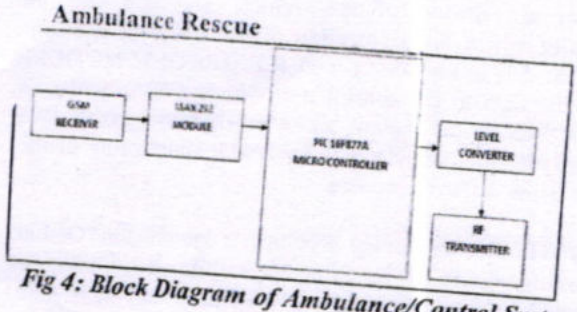

Fig 4: Block Diagram of Ambulance/Control System.

In control section GSM modem receives message about accident and send it to PC. Fig 5 explains the block diagram of control system. PC identifies the nearest ambulance and ambulance is instructed to pick up the patient. Control section transmits the control signal to all the signals in between ambulance and vehicle by RF transmission.

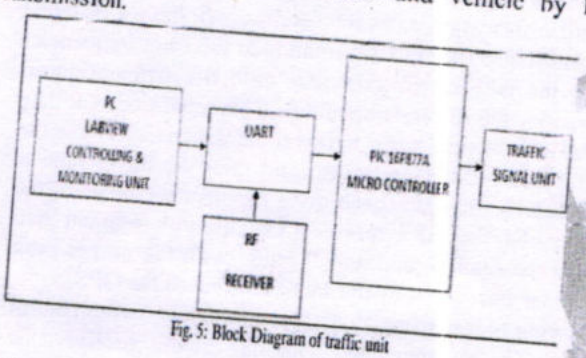

Fig. 5: Block Diagram of traffic unit

Fig 5 explains the block diagram of traffic unit. Whenever the ambulance reaches near to the traffic signal(approximately 100m), the traffic signal will be made to green through RF communication. Thereby the ambulance is recommended to reach the hospital in time.

V. CONCLUSION

There is exigent need of efficient traffic management system in our country, as India meets with 384 road accidents every day. To reduce this congestion and unwanted time delay in traffic and advance system designed here is this project. The next step forward is to implement this scheme in real life scenario for first hand results, before implementing it is on the largest scale. We believe that this may bring a revolutionary change in traffic management system on its application in actual field environment and also in this paper a novel idea is proposed for controlling the traffic signal in favour of ambulance during the accidents. Thus proposed system implemented in country with large population like INDIA can produce better results. The proposed system is more accurate with no loss of time but there may be a delay caused because of GSM messages, since its queue based technique which can be reduced by giving more priority to the messages communicated through the controller, the solution and the application scenario are developed accounting for a high level of nodes mobility.

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Survey on Automation system using Raspberry Pi-3 (IoT)

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Abstract: - **Automation plays an important role in science fiction writing but has only become practical, since the early 20th Century, due to the introduction of electricity into the Office cabin and the rapid advancement of information technology. Automation can control application by using the Raspberry-Pi. The main aim is to control the electrical appliances in office cabin by using internet, so it is used to interface Raspberry Pi with Wi-fi. The Raspberry Pi is interfaced with Sensors to sense the atmospheric conditions. It is also interface with user which can be turned ON/OFF by the controller using the IT. Raspberry Pi has inbuilt Wifi. Wifi can be given from nearest broadband connection or mobile. IoT using raspberry pi to the user having the android app. The authentication is in our hands ,i.e if we want to send the specific person inside the house, standing in front of the door then we can give permission to open the door, Software system can be built in three various programming languages and can be controlled via the internet using webpage protected with a username and password to make sure that it cannot be hacked.**

Key Words- **Home Automation, Raspberry-pi-3, Internet of Things (IoT), PIR sensor**

I. INTRODUCTION

In this project, we are designing a system which will control electrical appliances by using smart phone operated android app. There are three units in this project wi-fi unit, control unit, output unit. In this project there are components like PIR sensor, Web camera, Raspberry Pi-3, Smart phone for android app. PIR sensor is used to sense human ,i.e, when PIR sensor is sensed by a person standing in front of the door then web camera will be become on and then the image will be displayed on the user app who has the smart phone android app. He/she can control the electrical appliances by using smart phone operated android app. We are controlling three electrical appliances ,i.e, light, fan and lock. The controls of the specific appliances is given in the app. When the PIR sensor is sensed, web cam gets the signal and captures the image and sends it via IoT using raspberry pi to the user having the android app. The authentication is in our hands ,i.e if we want to send the specific person inside the house, standing in front of the door then we can give permission to open the door via the app otherwise not. We can control light and fan via the android app using the same procedure.

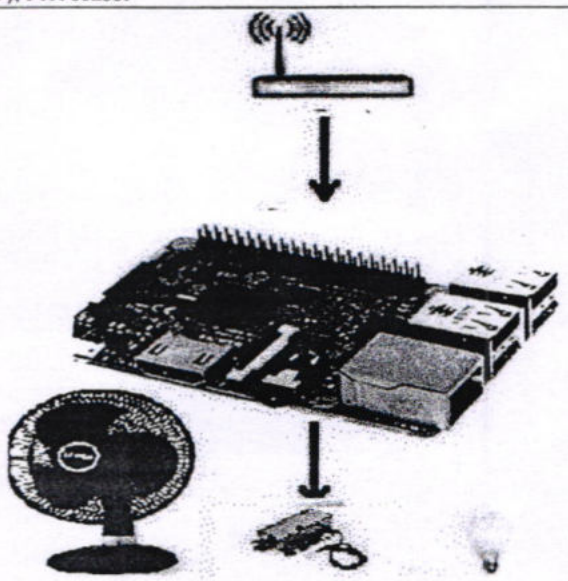

Fig -1: Overview of the system

Wifi range is between 10 to 100 meters. Raspberry Pi has inbuilt Wifi. Wifi can be given from nearest broadband connection or mobile. This project requires two Wifi connection one at raspberry end and other at user end. The control unit is used to control the electrical appliances via the smart phone.

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II. EXISTING SYSTEM

Raspberry pi is a mini computer. Arduino and rasp2 are not having inbuilt wifi. If we make this project by using rasp 2 and arduino we have to connect wifi module. So it is better to use rasp3. In existing the IR sensor is used but it does not give proper results so we used PIR sensor.

III. PROPOSED SYSTEM

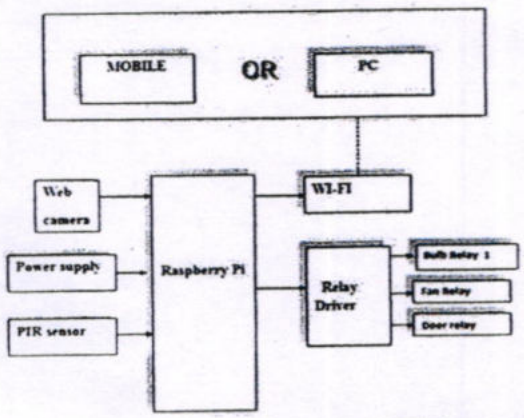

Fig -2: Block diagram of the system

The system works on 3.3v and 5v DC supply. Components connected to raspberry pi-3 are PIR sensor, relay driver IC ULN2803APG. The relay driver is connected to three electrical appliances such as light, fan and lock. When PIR sensor is sensed via a person then web camera captures the image and sends it to android app via raspberry pi. If the image displayed on the app is authenticated by the user having the app in his/her smart phone. Once the image is authenticated by the user having app in his/her smart phone then he/she can send that person inside the door by using the smart phone. After the door is opened the user having the app sends the signal to start the light and fan using smart phone operated mobile app.

IV. FEATURES OF THE PROPOSED SYSTEM

Raspberry pi-3:- The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi foundation. Raspberry Pi-3 Model B released in February 2016 is bundled with on-board Wifi, Bluetooth and USB Boot capabilities. As of January 2017, Raspberry Pi 3 Model B is the newest mainline Raspberry Pi. Raspberry Pi boards are priced between US$5-35. It includes various features such as ARM compatible central processing unit (CPU) and an on- chip graphics processing unit (GPU, a videocore IV). CPU speed ranges from 700MHz to 1.2GHz for the Pi 3 and on board memory range from 256 MB to 1 GB RAM. Secure Digital (SD) cards are used to store the operating system and program memory in either the SDHC or MicroSDHC sizes. Most boards have between one and four USB slots, HDMI and composite video output, and a 3.5mm phone jack for audio, Lower level of output is provided by a number of GPIO pins which support common protocols like PC. The model B have an 8P8C Ethernet port and the Pi 3 and Pi Zero W have on board Wifi 802.11n and Bluetooth.

Web-Cam:-

- 16 MP interpolated resolution
- Excellent quality & fashionable style
- True plug and play USB interface
- High quality CMOS sensor
- Clear, sharp still picture & motion video
- Support external microphone
- Auto white balance & exposure
- Adjustable lens

Relay Driver (IC ULN2803 APG)

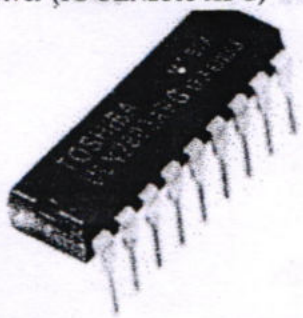

Fig -3: IC ULN2803 APG 500-mA-Rated Collector Current

- High-Voltage Outputs: 50 V
- Output Clamp Diodes
- Inputs Compatible With Various Types of Logic

Relay;-

- RW Series Relay covers switching capacity by 10A is spite of miniature size to comply with user's wide selection.
- RWH is approved C-UL & TÜV safety standard.
- The employment of suitable plastic materials is applied under high temperature condition and various chemical solutions.
- Complete protective construction is designed form dust and soldering flux.

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- 12A at 120VAC for RW & 12A at 240VAC for RWH are UL approved.

PIR sensor:-

- Simple three connections.
- Led indication.
- Module dimensions:- 25mm length, 32mm width ,25mm height.
- Supply voltage 5V.
- Detecting range upto 6 meters.
- Dual element sensor with low noise and high sensitivity.

Mobile:-

- Requires a android operated phone.
- Requires a mobile which has a feature of internet.

V.SOFTWARE DESCRIPTION

Steps of the project
1.START
2.Initialize Rasberry-pi-3, web-cam, PIR, Relay drive
3.PIR sensor detector=?
4.Web-Cam ON
5.Image Show in android application
6.Through android application user control the door open or close
7.User through application operate bulb and fan also.
8.Stop.

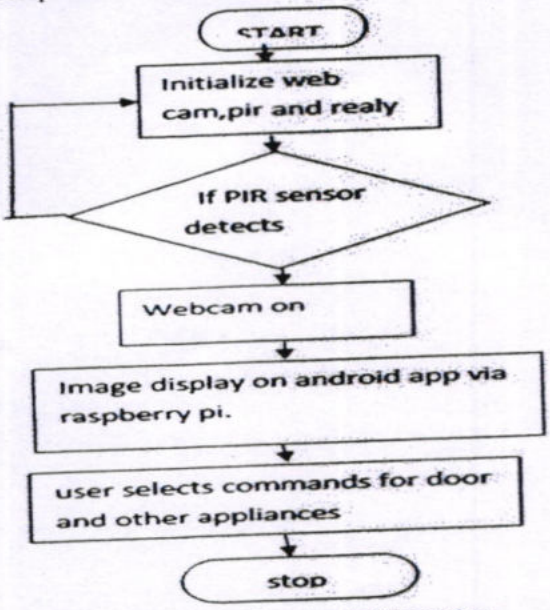

Fig -4: Flowchart of the system

VI. CONCLUSION

We have designed this project to reduce human efforts and provide security.

VII. RESULT

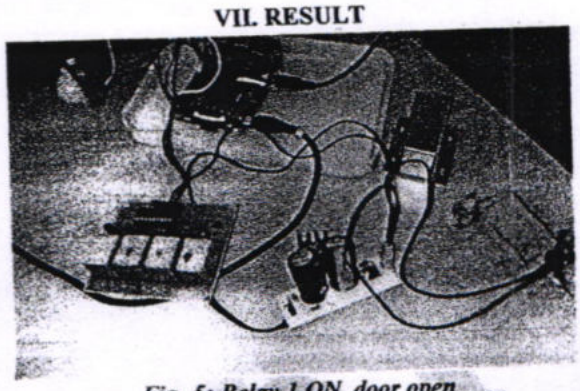

Fig -5: Relay 1 ON, door open

Fig -6: Relay 2 ON, light ON

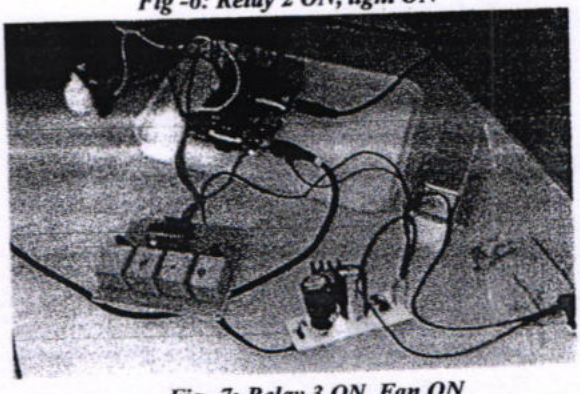

Fig -7: Relay 3 ON, Fan ON

VIII. ACKNOWLEDGMENT

We would like to take this apportunity to express our heartly gratitude and sincere thanks towards our guide Prof.Sarika N. Patil for her invaluable assistance for our project.We express our sincere thanks to the HOD of E&TC and ELEX department Prof.Gayatri S. Ambadkar and our respected principal Dr.Rajendra Kanphade for making full time availability of the laboratories and necessary equipments and also to all staff members for their encouragement and suggestions during the partial fulfillment of the project.

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Survey on Applications of Image Processing In Agricultural Field

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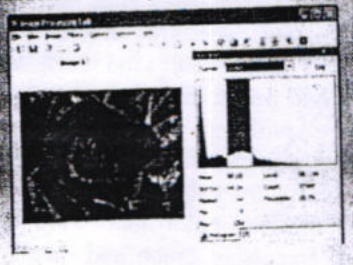
Abstract: **- Mono cropped plantations are unique to India and a handful of countries throughout the globe. Essentially, the FOREST approach of growing coffee along within India has enabled the plantation to fight many outbreaks of pests and diseases. Mono cropped Plantations are under constant threat of pest and disease incidence because it favours the buildup of pest population. To cope with these problems, an automatic pest detection algorithm using image processing techniques in MATLAB has been proposed in this paper. Image acquisition devices are used to acquire images of plantations at regular intervals.Theseimagesarethen subjected to pre-processing, transformation and clustering.**

Key Words- **CCD camera, Trinocular microscope, RGB, EX-C filters, BIAS Software.**

I. INTRODUCTION

IMAGE PROCESSING

- Image processing is any form of signal processing for which the input is an image, such as a photograph or video frame and the output may be either an image or a set of characteristics or parameters related to the image



Today there are more than 250 organic pesticides and thousands of formulations. The coffee industry unfortunately relies on these poisons to protect he plant and berries from insect attack and disease spread. In some advanced countries aerial spraying of these hazardous chemicals is carried out to save on labor costs. Most, coffee farmers advocate the use of BROADSPECTRUM pesticides. These are more dangerous than system ic pesticides because they acton many insects both beneficial and harmful. There is every chance that these chemicals can easily drift or get washed or leached by heavy showers and reach ground water or open estuaries there by contaminating the earth's precious water reserve. However, the cultivation of these crops for optimum yield and quality produce is highly technical. Alotofre search has been done on greenhouse ago systems and more generally on protected crops to control pest sand diseases by biological means instead of pesticides. Research in agriculture is aimed towards increase of productivity and food quality at reduced expenditure and with increased profit, which has received importance in recent time. A strong demand now exists in many countries for non-chemical control methods for pests or diseases. However no automatic methods are available which precisely and periodically detect the pests on plants. In fact, in production conditions, greenhouse staff periodically observes plant sand search for pests. This manual method is time consuming. With the recent advancement in image processing pattern recognition techniques, it is possible to develop an autonomous system for disease classification of crops. In this paper, we focus on early pest detection. First, this implies to regularly observe the plants. Disease images are acquired using cameras or scanners. Then the acquired image has to be processed to interpret the image contents by image processing methods. The focus of this paper is on the interpretation of image for pest detection.

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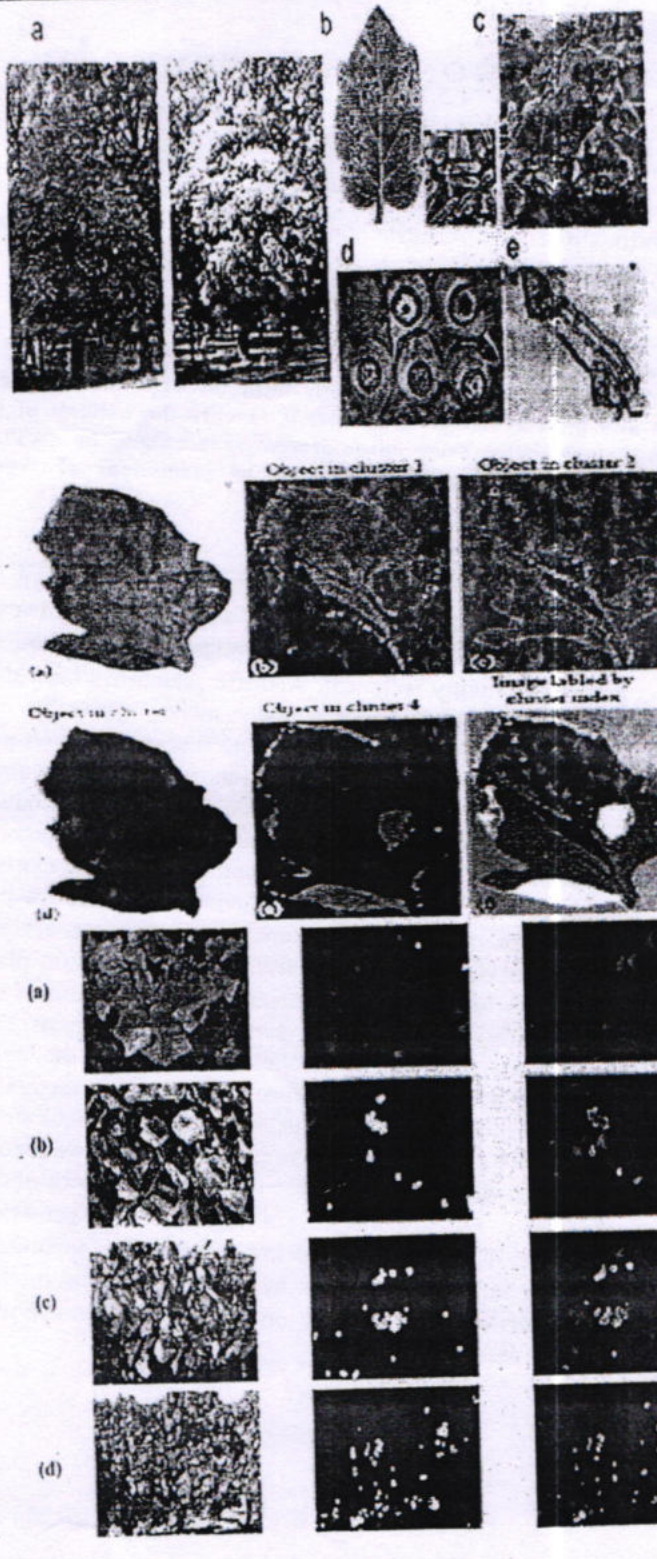
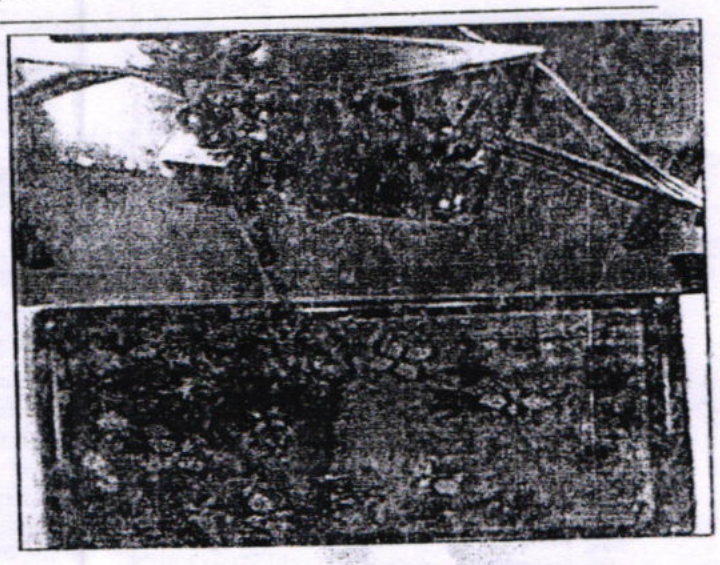
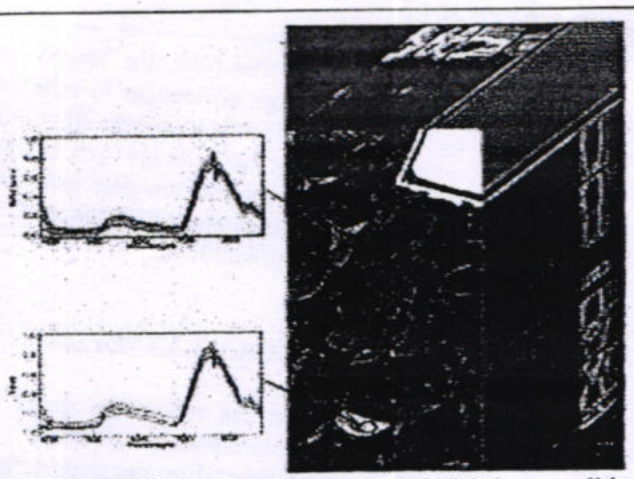




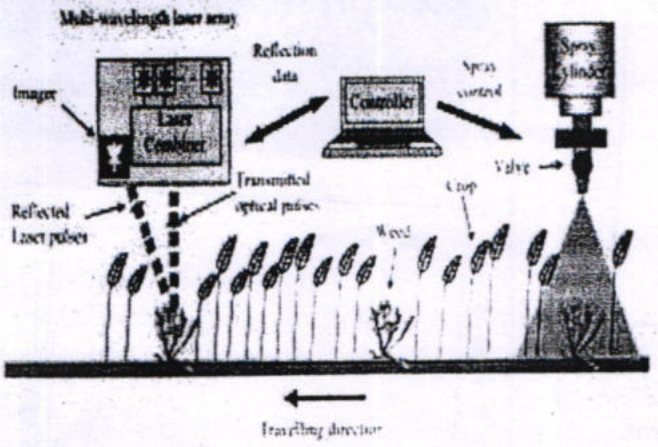
II. WEED DETECTION

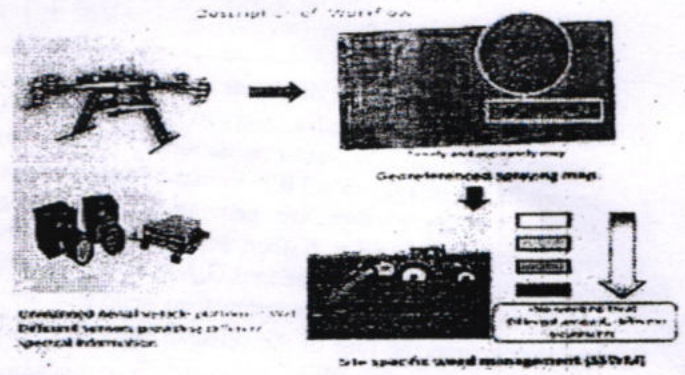
Weeds were the plants growing in wrong place in farm which compete with crop for water, light, nutrient sand space, causing reduction in yield and effective use of machinery. Weed control was important from agriculture point of view, so many researchers developed various methods based on image processing. Weed detection techniques used algorithms based on edge detection, color detection, classification based on wavelets, fuzzy etc. Real time weed recognition system for identifying outdoor plant using machine vision uses edge based classifier to identify broad and narrow weeds.[8] Images acquired in RGB were converted to gray scale sand used to process as binary image. Bright pixels in dark background were identified as Weed and classified as in broad and narrow using threshold values. The limitation that proposed model does not classify mixed weeds. In color detection method images were captured adjusting color gain sand shutter time to gray plates. [9] Excessive green and thresholding was used fc segmenting volunteer and nonolunteer potato plant regio Image was then transformed using EGRBI matrix to separate intensity information.EG and RB values help to separate potato pixels from sugar beet pixels. Pixel classification based on K-means clustering and Bayes classifier was used to measure the Euclidean distance. ART2classifierwasalsotestedfor Euclidean distance based clustering. Objects classified on threshold value were identified as potato plants VP and sugar beet SB. Neural network based classification has proven better than K- mean Look up table approach in classification of objects whereas lookup table was four time faster than NN. For



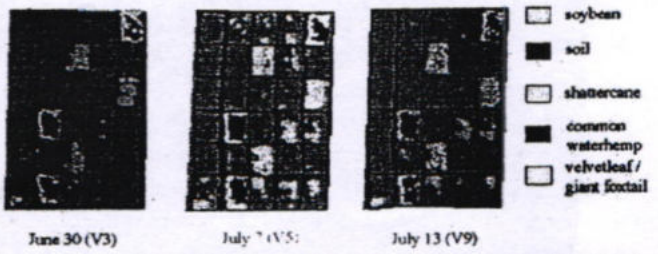
Outdoor conditions plant growth and lighting conditions need to considered and adaptive methods required for classification in such conditions. Statistical methods such as mean and standard deviation were used for image classification of weeds into little, narrow and broad weeds. [11] But the limitation of method was that it cannot be applied for classification of mixed weed. Classification success rate of statistical method was less compared to color method with classifiers.

Feature extraction techniques using color image processing for weed detection with FFT and GLCM were discussed.[10] Excess color Ex-C filter was used to remove the color red and blue with green as an intensity value. Ex-C was implemented using formula 2*G-R-B. Gray level co-occurrence matrix and FFT were used as feature extraction tools. GLCM represents the occurrence of gray levels in an image and its relationship in co-occurrence matrix.



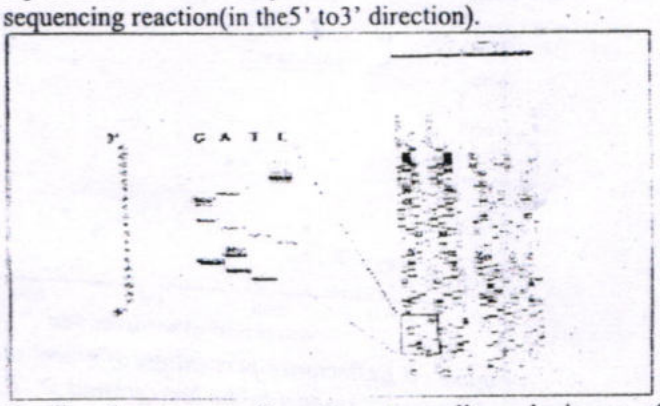


Minimum Distance Classifications



III. SOFTWARE FOR AUTOMATED READING OF DNA SEQUENCING AUTO RADIOGRAPHS

DNA sequencing, the method of determining the order of occurrence of nucleotides in a DNA molecule is commonly performed either by the chain termination method or by the chemical Degradation method. Figure2showsan example of a DNA sequencing auto radio graph and the sequence as determined from it. The sequence is read from the bottom to the top by representing each band in the respective lane (labeled G,A, T and C)by that particular base and the order of occurrence of these bases in all the four lanes together represents the DNA sequence of the template used in the sequencing reaction(in the5' to3' direction).



Reading the sequence from the auto- radiographs is one of the tedious steps in large-scale manual DNA sequencing. This step may also contribute to some errors in the sequence output. Windows based software has been developed in

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Electronics Systems Division as well as in Computer Division that enables the user to generate the DNA sequence from digitized auto radiographs. These programs accept in put images in a TIFF format (Tagged Image File Format) which in turn are generated by scanning the autoradiographs on a flatbed scanner. The user has to select the lanes and label the mas G,A, Tor C and detect the peaks in each lane. The program then generates the DNA sequence from the four of the selected lanes in ASCII text format and stores in a file.

IV. MULTISPECTRAL MONITORING,A USEFUL TECHNIQUE FOR AGRICULTURE

Multi spectral monitoring is used for analysis of the physiological status of crops in remote sensing. These operations can be simulated with the use of CCD camera and band pass filters. The digital images of the leaves are grabbed with various band pass filter sand the reflectance is measured using the BIAS software (Fig.3).

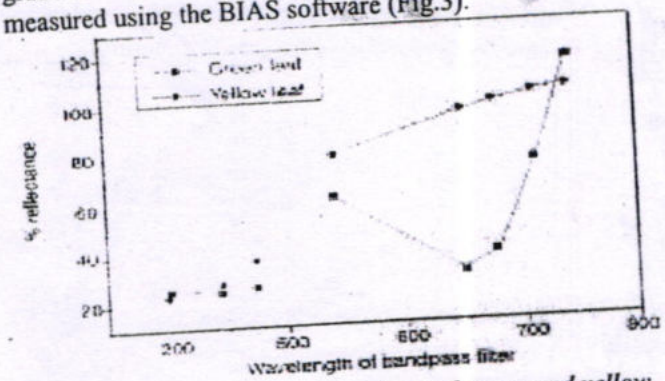

Figure : 3 Reflectance percentage of green and yellow leaves with respect to the background at different wavelengths

If the leaves are healthy they absorb more light in red region and also reflect more in near infrared region. BIAS software offers a facility for pixel to pixel subtraction of the images. If the image taken with red filter is subtracted from the image taken with near infrared filter, the healthy leaves will appear brighter due to large differences in reflectance. Since the unhealthy leaves reflect considerable light in both red and near infrared regions, their image will be darker after subtraction. Thus, multispectral imaging can help to monitor the physiological status of crops in fields and will, therefore, be very useful in agriculture

V. IMAGE HISTOGRAM ANALYSIS

The use of image histogram can reflect the direct effect caused by the illumination where the contrastisafeatureforgreennessidentificationasreportedbyRo meoetal. (2013).They designed a system based on histogram analysis of images with decision-making module determining sufficient greenness. Other work on yellow-skin potato defect detection was presented by Jinetal. (2009) which observed that the majority of defects lies through or black spots with low proportion and no signify cant peak in gray level histogram, see Figure1. In continuing image enhancement procedure, Wuetal. (2013) analyzed image histogram and noticed the gray rate in the enhanced image. This helped in deriving appropriate enhancement algorithm for foreign fiber detection in cotton products.

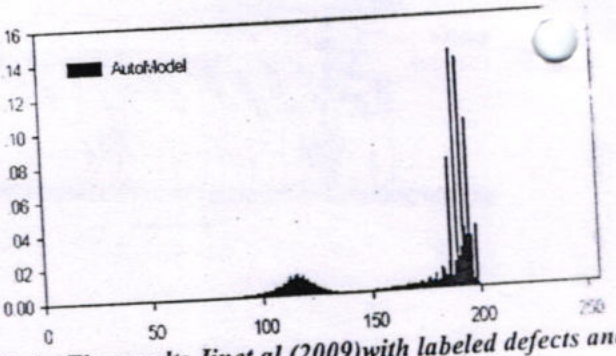

Fig.1 The results Jinet al.(2009)with labeled defects and the corresponding histogram.

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VI. CONCLUSION

We have attempted to extend image processing and analysis technology to a broad spectrum of problems in biology. A software CytoPro has also been developed for chromosome analysis, which can quantify the micro-scopic images of cells and chromosomes with the help of a CCD camera mounted on the camera port of a trinocular microscope. All the applications mentioned in this article are described in details in Lecture notes for DAE-BRNS Workshop, 1998.Someof the software programs for image processing and analysis described above are now available in the market and a question is generally asked as why should one try to develop Indigenous systems. The computer based image processing is undergoing rapid evolution in parallel with computing systems. The dedicated imaging systems available in the market, where user can press a few key sand get the results, are not very versatile and more importantly, they have a very high price tag on them. Additionally, it is hard to discern as to how the results are being produced. The open ended imaging systems in BARC are mainly meant for those scientists who i)care to follow ho their image data is processed before producing the final results, ii) want to upgrade and innovate their systems with changing times, and also iii) want to search new frontiers in their fields for applications of this technology.

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Smart Trolley in Mega Mall

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Abstract: - **Microcontroller based design has acquired the status of the most happening field in electronics. This is the highly specialized field that has the power of integrating thousands of transistors on a single silicon chip. Nowadays, in the mall for purchasing variety of items, it requires a trolley. Every time customer has to pull the trolley from rack to rack for collecting items and at the same time customer has to do the calculation of those items and need to compare it with his budget in a pocket. After this procedure, the customer has to wait in queue for billing. So, to avoid a headache like pulling trolley, waiting in billing queue, thinking about budget, We are introducing a new concept that is "SMART TROLLEY IN MEGA MALL". In the modern era, for automation of mall, we are developing a microcontroller based TROLLEY which is totally automatic. It follows the customer while purchasing items and it maintains a safe distance between customer and itself. The customer has to hold the barcode side of the product wrapper in front of barcode scanner. Then corresponding data regarding product will be displayed on display. By using this trolley, the customer can buy a large number of products in very less time with less effort. At the billing counter, the computer can be easily interfaced for verification and bill print out.**

Key Words- **Optical sensor, Barcode scanner, Development Board, Zigbee Technology, Microcontroller.**

I. INTRODUCTION

1.1 Motivation

- Reason Behind Choosing Microcontroller Based System:

In this paper, we have designed system by using microcontroller, because microcontroller based system are less bulky and also easily transferable. It requires less power. So the system becomes cheap. It requires less space, easy to install, so can fitted easily in the robot.

- Benefits To The Customers :

This paper has an artificial intelligence of tracking the customer path requ. So that, if track has been set then there is no need of manual function. That's why customer needs less effort to pull trolley. Customer gets on the spot billing facility.

- User Friendly And Cost Effective:

As this system uses microcontroller, it operate on less power and ire less space, it is user friendly and cost effective.

1.2 Generic Approaches (Present Status):-

Microcontroller based design, has acquired the status of most happening field in electronics. This is highly specialized field that has the power of integrating thousands of transistors on single silicon chip. Nowadays, in mall for purchasing variety of items it requires trolley. Every time customer has to pull the trolley from rack to rack for collecting items and at the same time customer has to do calculation of those items and need to compare it with his budget in pocket. After this procedure, customer has to wait in queue for billing. So, to avoid headache like - Pulling trolley, waiting in billing queue, thinking about budget. We are introducing new concept that is "SMART TROLLEY IN MEGA MALL".

II. SYSTEM DESIGN

2.1 Block Diagram:

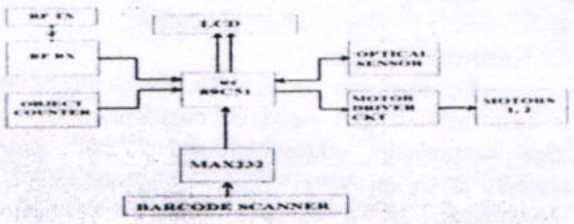

Fig 1: Block Diagram

2.2 Methodology

Optical sensor: - In this paper we have adopted the Obstacle Detection methodology. It is used to keep safe distance between trolley and customer If obstacle is far away from sensor, it does not give reflected back signal and if obstacle is in range of sensor then it will get the reflected signal then obstacle is detected.

Fig 2: Optical Sensor

Barcode scanner:-In barcode black and white strips are present. Black strip absorbs all light transmitted by transmitter and doesn't reflected back. White strip reflects the light rays. This is the basic principle of barcode scanner.

Fig 3: Barcode Scanner

RF Transmitter-Receiver:- At the transmitter section the control signals are transmitted using radio frequency. These control signals are transmitted serially. At receiver section these signals receive and decoded.

Advantages:-

1. Each barcode has unique identity.
2. Barcode gives total information about product related data.
3. Barcode maintains secrecy.
4. Easy to generate tags of barcode.

2.2 Hardware Design:-

1) Development Board: - The development board is hand held, battery powered microcontroller board ideal for personal, educational and research robotics projects. Based on AtmelAT89V51 microcontroller, the Development board includes 64K of flash RAM, outputs for two DC motors, inputs for variety of sensors like Barcode scanner, Optical sensor, Object counter and a 16x2 alpha numeric LCD screen.

III. SYSTEM IMPLEMENTATION

System Operation:-

The 89V51 microcontroller is heart of our system. The optical sensor which maintains distance between trolley and customer is connected to port 0 of microcontroller.

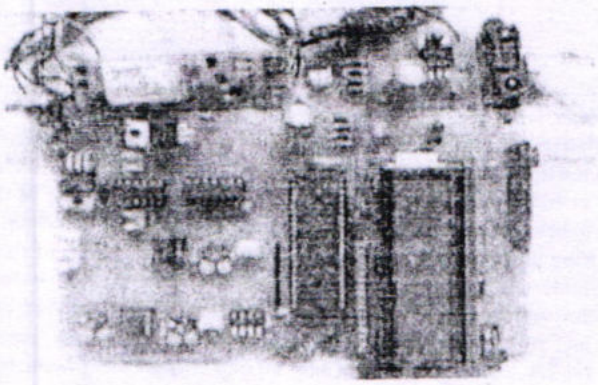

Fig 4: Develpoment Board

Hadware Of Rf Module:-

RF Transmitter:- The ST-TX01-ASK is an ASK Hybrid transmitter module.ST-TX01-ASK is designed by the Saw Resonator, with an effective low cost, small size, and simple-to-use for designing. RF transmitter section is used for the operations like i) Left turn, ii) Right turn,

iii) Stopping and iv) Reversing.

Features: Frequency Range: 315 / 433.92 MH, Supply Voltage: 3~12V,
Output Power: 4~16dBm, Circuit Shape: Saw
RF Receiver:-The ST- RX04-ASK is an ASK superhet receiver module with PLL synthesizer and crystal oscillator. This module receives the transmitted data and decoding is carried out using IC HT12D. This decoded data is forwarded to microcontroller.

Features:

On-Chip VCO with integrated PLL using crystal oscillator reference.
Integrated IF and data filters.
Operation voltage: 5 Volts.
Available frequency at : 315/434 MHz

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2.4 Software Design:

Programming P89V51RD2: P89V51RD2 robot programming involves two steps. First step is to write and compile the code and generate the "*.hex" file. Second step is to load this "*.hex" file on the microcontroller using Flash Magic software provided by NXP (formerly Phillips).We are going to use Keil-U-Vision (Version 3) software for writing the code for the Microcontroller. According to distance between trolley and customer, microcontroller takes decision whether to drive motor or not. Motor driver circuit is connected to port 2 of microcontroller. In our system, trolley turning, stopping, reversing facility is provided using RF trans-receiver section. Barcode scanner is used for on the spot billing purpose in trolley. Barcode scanner is connected to microcontroller at serial port pins using MAX232IC.Quantity mismatch detector is nothing but 38 KHz IR trans-receiver and is connected to port__. LCD 16*2 alphanumeric display is used for displaying quantity & costing of products. When the power supply is switched on, system initializes and displays "MALL AUTOMATION".

Fig 5: LCD display as Mall automation

After certain time it displays.

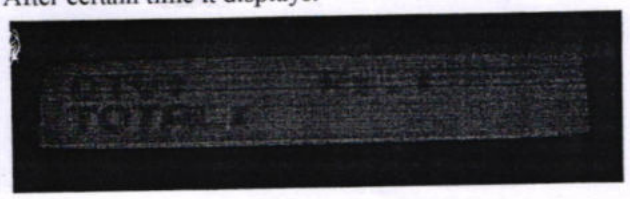

Fig 6: LCD display as Rs. 1 and Total

Now as we are using GP2D12 distance sensor this is analog sensor that converts distance between customer and trolley to corresponding voltage. This voltage is compared with the reference voltage at LM358 comparator. According to output level of LM358, trolley runs or stops. In this way, whenever customer walks trolley will follow him.If at any time customer wants to turn or reverse the trolley, remote controlling is available. This is provided in customer's hand. Whenever customer wants to turn, he just has to press the corresponding button on remote control. According to button pressing, code goes to IC HT12E encoder & this encoded data is given to RF transmitter & further transmitted. At receiver side, transmitted data is received by RF receiver & decoded by using IC HT12D decoder & further provided to microcontroller.

Now whenever customer wants to buy a product, he will stop & obviously trolley too. Now whenever customer will take any of the products, then he has to hold the barcode side of that product in front of barcode scanner. Then scanner will scan & corresponding data will be compared with the database which is already stored in the ROM of
microcontroller. As we have assigned the specific cost for every barcode, so it will display...

1. Number of items collected
2. Cost of current item
3. Total cost

Fig 7: LCD display as Rs.001 and Total Price

At any instant, customer wants to remove any of the collected items, then "Delete" button is provided for that purpose. Then customer has to press the delete button & just to hold that item in front of barcode scanner. Automatically corresponding cost will be deducted. If customer will put the item directly in the trolley without holding in front of barcode scanner, then IR 38 KHz pair i.e. "Quantity mismatch detector" will detect & buzzer will give sound & display will be as...

Fig 8: LCD display as warning remove product

IV. RESULT & CONCLUSION

In Automatic trolley, there is no need to pull heavy trolley, no need to wait in billing queue and no need of

thinking about budget. The microcontroller based trolley automatically follows the customer. Also it maintains safe distance between customer and itself. It gives number of products in trolley and total cost of the products on the spot. It gives facilities like trolley stopping, turning right or left. So, we could successfully implement the concept of Automatic trolley.

V. FUTURE SCOPE

Remote control handling can be eliminated using GPS system. All billing information in microcontroller can be send to central computer using Zigbee technology.

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RESEARCH ARTICLE

Smart New Era Agri Applications Using Optoelectric System

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Now days we are facing lot of energy crisis day by day, because of the many factors, that to agriculture system is the most affected one from the power supply due to the lack of quality of power supply and interrupted power supply. Due to this we are failing to supply water to the crops in the required time because of this crops are getting affecting and we are not getting enough yields. The country's 60% economy is mainly depends on the growth of the agriculture. The overall scope of proposed concept is to assess the technical, economic, and environmental suitability of PVWP technology for rural and agricultural purposes, specifically for restoration of degraded grassland and farmland conservation considering water as a major compcnent of rural improvement and nourishment security, the time has come to settle on shrewd options in water system to limit water misfortunes, asset that is winding up progressively uncommon interest for progressively solid. Hence the project also monitor's the farms in the field using the concept of IoT (Internet of things). By using the IoT, the development time gets reduced and thus time for monitoring the farms. Also need not to worry about the health of crops and the readings are displayed in the server automatically through the wireless network. The pump can be switched ON or switched OFF from any part of the world using the concept IoT (Internet of Things). Temperature sensor sense the heat in the atmosphere, according to the climate, the switch will be automatically ON/OFF motor. Moisture sensors sense the soil moisture content and switch on or off the pump according to the readings displayed in the web page.

Keywords: Agriculture, Energy, PV System, IOT.

1. INTRODUCTION

Agriculture sector being the backbone of the Indian economy deserves security and hence an agricultural product needs security, monitoring and maintenance at very initial stage. These challenges should be taken into consideration.[1–4] The combination of traditional method with software technologies like Internet of Things and Wireless Sensor Networks can lead to agricultural development.[5] Keeping this scenario the concept "Internet of Things" have been tested and analyzed based on the device and is capable of analyzing the sensed information and then transmitting it to the user.[9] This project can be used to control and monitor the agricultural fields from remote location. This proposed system is oriented to provide smart irrigation and delivering real time notification based on information analysis and processing without human intervention.[10]

Cloud computing and internet of things (IOT) are two new concepts emerged since the Computer era. They are the core of IT industry of the new generation.[11] Not long after the Prime minister of the India Narendra Modi put forward the idea of "Digital India" in 2015 PM raised the development idea of "Digital India," which mainly emphasized the development of IOT and strategic new industries.[12–16] IOT is closely related to cloud computing in a way that IOT as it is connected to internet. India is a typical agricultural country with productivity of rice, wheat, fruit, and cotton. Agriculture, rural area and farmers are of particular important when it comes to socialist modernization of the India.

Our approach that we are concentrating on the building perspective and the business part of this undertaking. The designing side of this venture will manage how we envision the sun oriented direct framework to work.[17] The exploration is as of now existing cases in different parts of the world. We will build up an outline and plan on how the close planetary system will be set up. For the business side, this will include the productivity from this venture and what can be normal as far as its income and cost funds.[18]

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RESEARCH ARTICLE

2. BLOCK DIAGRAM

The Figure 1 shows the block diagram of the IoT based controller for smart Agri application. There are two fundamental sorts of sun oriented controlled water pumping frameworks, battery coupled and coordinate coupled. An assortment of elements must be considered in deciding the ideal framework for a specific application. Our approach that we are concentrating on the building perspective and the business part of this undertaking.

The designing side of this venture will manage how we envision the sun oriented direct framework to work. The exploration is as of now existing cases in different parts of the world. We will build up an outline and plan on how the close planetary system will be set up. For the business side, this will include the productivity from this venture and what can be normal as far as its income and cost funds, and so on.

In this we undertaking, and attempt to build up a general condition that is basic however it will be helpful to know how much water and power do we requirement for any surface territory and what will be the cost for utilizing a sun oriented direct framework by gathering a few information, for example, the atmosphere, the surface range, elevation above ocean level. While looking in terms of monitoring aspects the presence of water in the well is monitored and then the moisturizing level of the soil and the temperature of the surroundings are monitored.

These values are monitored by using respective sensors and are feed to the controller. The pump control button will present on the webpage and can be controlled based on temperature and moisture level. The water level in the well is stated in two states as F (full/water present) and E (Empty state).

If the water level is monitored as empty instead of pump motor is used for water extraction. In case of intruder the farmer will be alerted through webpage. Here when the intruder arrives the buzzer will be alarmed to scare the animals and give initial level of security.

2.1. Arduino Board

It is the heart of the project, the controlling of the motor, sensors and GSM module. Arduino board designed using a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O)

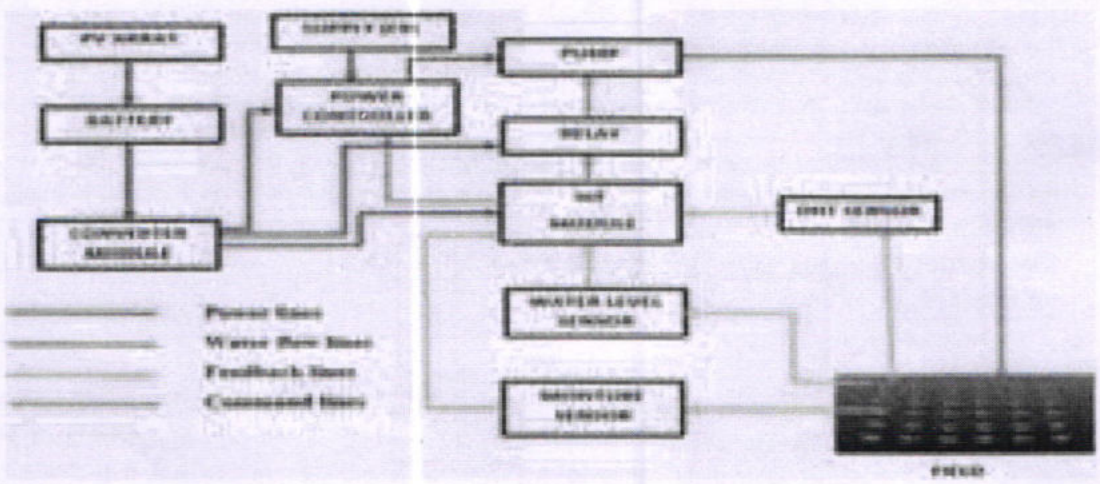

Fig. 1. Block diagram of the proposed smart agri system with PV system.

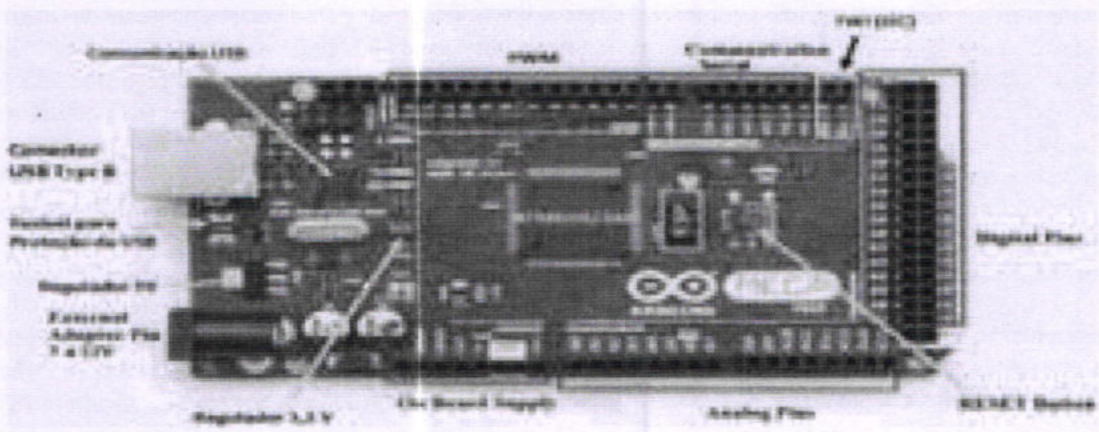

Fig. 2. Arduino board.

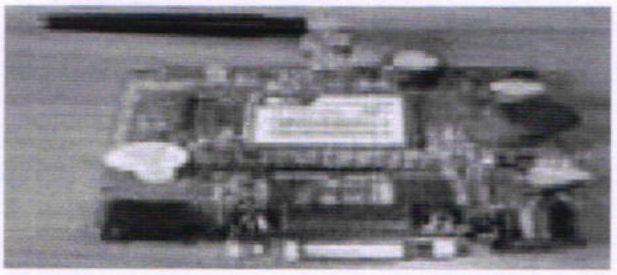

Fig. 3. GSM module.

pins that may be interfaced to various expansion boards and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB), which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. The microcontroller uses the input given by the sensors to perform the required task. The Figure 2 shows the Arduino board pin diagram.

2.2. GSM Module

The system uses GSM module is used to have the access of the status of the motor, temperature, humidity, moisture of the field. The GSM based communications is used to provide the internet access to the IoT module. The Figure 3 shows the GSM module diagram.

2.3. IoT (Internet of Things)

The system is interfaced with the IoT (Internet of Things) by which the farmer can have the access of the farm all over the globe. IoT also provides the detailed values of temperature, humidity, moisture of the field. The IoT is accessed by the help of an open software named as ThingsView. Thus the operator can observe the status of the temperature, humidity, soil moisture and the pump status (ON/OFF).

3. METHODOLOGY

The main objective of this project is to design a simple, easy to install, GSM and Arduino Mega 2560 based circuit to switch ON and switch OFF of motor, without the presence of the labor in the field.

GSM acts as an interface between the motor drive circuit and the farmer. The GSM is used to interface the IoT (Internet of Things) with the motor, sensor etc. the open source used for IoT (Internet of Things), is ThingsSpeak. The user can be in any part if the world he can get the information of the moisture level, water level, temperature, humidity and motor ON/OFF condition. All the values can be viewed in the mobile, PC, etc. by the help of the app ThingView–ThingSpeak viewer.

The Arduino mega 2560 is used to operate the whole mechanism automatically without any human intervenes. The Arduino mega 2560 is programmed in such a way that the soil moisture level is measured using moisture level sensor, in case if the value is below 25% then the data is sent to the Arduino mega 2560 then the relay is triggered i.e., the relay is NC, by the Arduino program the thus the water pump is turned on then on the based on the water level in the field the water pump is turned off. Even the value of temperature, humidity by which the farmer can analyze the climatic condition. The Arduino is interfaced with the GSM module thus the data can be accessed by the user from any part of the globe.

4. APPLICATION

4.1. Agriculture

Shortage of power combined with the expanding lack of quality of rainstorm and predominant expensive diesel pumping frameworks represent a monetary hazard to little and peripheral agriculturists. A mind boggling set of elements including a dangerous atmospheric deviation, aggressive land utilize and absence of fundamental framework is making new difficulties for India's huge agrarian populace.

The consistently expanding crisscross amongst request and supply of energy, and power specifically, is posturing challenges particularly to farmers in remote territory. Agrarian innovation is evolving quickly. Homestead apparatus, cultivate building and creation offices are always being made strides.

Rural applications reasonable for photovoltaic (PV) arrangements are various. These applications are a blend of individual establishments and frameworks introduced by service organizations when they have discovered that a PV arrangement is the best answer for remote farming need, for example, water pumping for products or animals.

A sunlight based controlled water pumping framework is comprised of two essential parts. These are PV boards and pumps. The littlest component of a PV board is the sun oriented cell. Sun powered pumping can help balance the cost of customary water system fills. The all the more frequently a pump is run, the more noteworthy the open door for investment funds from sun based.

Sunlight based pumps are dependent only on the sun to give control and consequently work just amid light hours unless combined with a battery/stockpiling framework. Sun powered pumps might be a decent choice for bring down water volume and daytime water system frameworks. So far, reasonable sun based innovation can't supply adequate energy to draw enough water for substantial scale surge water system.

5. RESULT

Consider that only one IM is connected to the PV system. The speed of the motor is dependent on availability of PV power. At any case the controller of IM maintains energy management between load and source (Fig. 4). However if solar power is very low that indicates reference speed

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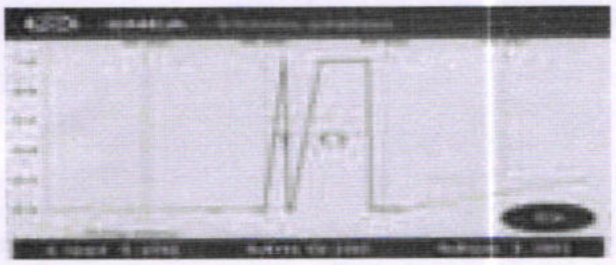

Fig. 4. Soil moisture status in Thing-View app.

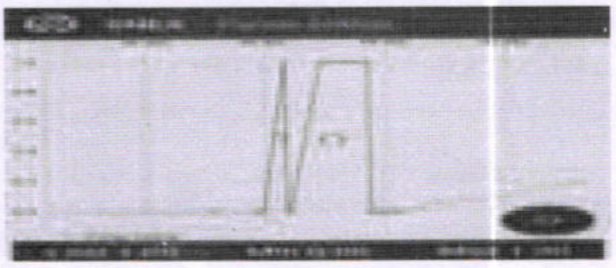

Fig. 5. Pump ON/OFF status in Thing-View app.

of IM is below the base speed (ωt) then the motor cannot pump the water (Fig. 5).

This project is not only beneficial in terms of its reduced cost. Solar system energy uses an energy source (the sun) that is consistently available. It will be a clean source of energy and will not do damage to the environment and to the nature. Furthermore it will not harm our earth, and since it uses renewable energy, it will last forever (Fig. 6).

The main expected outcome of the proposed concept is to develop the low cost PVWP for smart agriculture and to provide continuous supply for the agriculture purpose, and supply the water to the irrigation filed whenever the crops is required with solar PV system by independently without depending on the KEB supply.

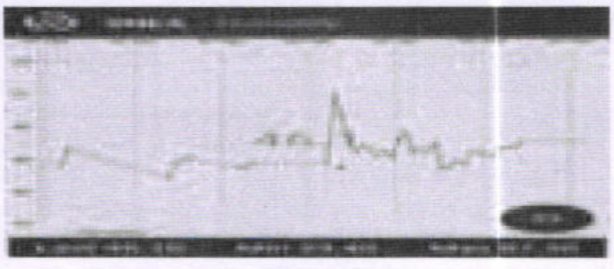

Fig. 6. Humidity status in Thing-View app.

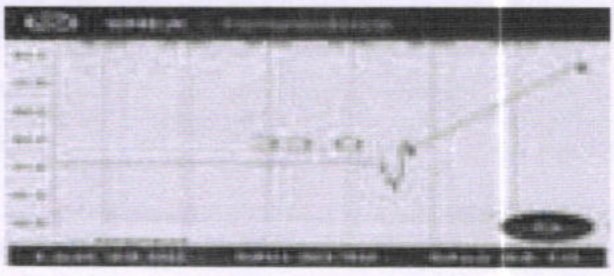

Fig. 7. Temperature status in Thing-View app.

The below figures shows the working of the project in the Thing-View output obtained. Based in the real time working. Which is shown in Figure 7.

6. CONCLUSION

This project is not only beneficial in terms of its reduced cost. Solar system energy uses an energy source (the sun) that is consistently available. It will be a clean source of energy and will not do damage to the environment and to the nature. Furthermore it will not harm our earth, and since it uses renewable energy, it will last forever. The main expected outcome of the proposed concept is to develop the low cost PVWP for smart agriculture and to provide continuous supply for the agriculture purpose, and supply the water to the irrigation filed whenever the crops is required with solar PV system by independently without depending on the KEB supply.

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11

SMART HOSPITALS USING INTERNET OF THINGS (IOT)

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ABSTRACT:

This presentation about smart hospitals using iot. Most of the time, due to negligence of hospital staff, excessive number of patients or inactiveness of relatives it may cause heart attack due to "AIR EMBOLISM". In a hospital, number of electrical eequipments (fan, lights) is more so usage of energy is also more. Thus, its is important to use electricity as per the requirement. Thus, in this paper we have proposed a system which includes combination of sensor technology and IOT. Using this system one can control switch of the electricity and monitor level of the saline bottle from distant position.

KEYWORDS: Internet of things, Atmel 328pu, ultrasonic sensor (HC-SR04), Temperature sensor (LM35), light dependent resistor (LDR), MQTT protocol.

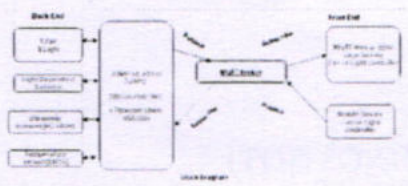
1. INTRODUCTION:

The project is based on the IOT by which we can solve the problems related to hospitals. In a hospital, there is excessive use of electricity used by light, fans and various medical appliances. One of the biggest causes of excessive energy use in hospitals comes from amount of electrical equipments, lightning, and electronics and how to often it is left on when there is no use of it.

The primary environmental effect of energy overuse is an increase in carbon footprint, but there are simple changes we can make to avoid this. For example, if the devices are kept running when they are not in use, the result is an increasing electrical use and consequently a bump in the amount of green house gases that enter the atmosphere. This module helps to control consumption of electricity.

One more important problem related to hospital is nurse or hospital staffs need to

constantly monitored the level of saline bottle. So it may happen that due to the negligence of the staff or due more number of patients and inactiveness, saline bottle may not monitored properly which can lead to the death of the patient this can happen when saline bottle is fed completely to the patient and when it is not removed then due to pressure difference between patient's blood flow and empty saline bottle. In this system using IOT one can control switch of the electricity and continuously monitored the level of saline bottle



In the below block diagram, there are three parts which as follows

2. BLOCK DIAGRAM:

1. Back end which includes fan, light, ultrasonic sensor etc.

2. Arduio mega (ATMEGA Atmel328pu) +Ethernet shield (W5100)

3. MQTT broker as a cloud server

4. Front end which includes HTML page or mobile device which includes switch controller for fan and light.

In this system ultrasonic sensor, light dependant on resistor and temperature sensor is interfaced with Arduino mega board. This board is connected to MQTT server via Ethernet cable. This will provide connectivity to the server to transmit data on the internet

3. WORKING METHADOLOGY

Above system will work as follows

In the above system sensor will acquire the data from the surrounding i.e., temperature sensor will constantly modify monitor the temperature of patients room, ultrasonic sensor will monitor the level of saline bottle and LDR will monitor the illumination of a light on it in terms of resistance value.

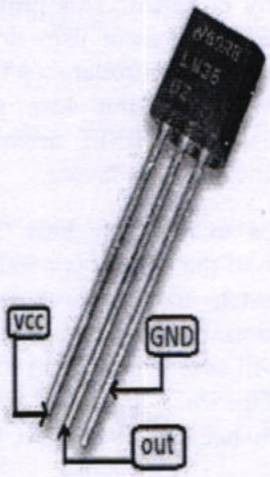
Data acquire by all of these sensors will be transmitted by USB which is used for data transfer to AM board. This data is then publish to the MQTT server via Ethernet.

Whenever one wants to acquired this data then that person has to subscribe to the MQTT server and then hospital staff, they can monitor the data received. MQTT platform is used to control to the switch which will ultimately control electrical appliances.

Whenever temperature of the patients room increase above predefined level, it will send the data to the page and then from the webpage or from the mobile device. In case of saline bottle, level of the saline bottle continuously sends on to the server so that hospital staffs need not to go to each and every patient's room to monitor it. As soon as the level of liquid in a saline bottle falls below predefined value then nurse can go to the patient's room and change that bottle.

4. COMPONENTS REQUIRED

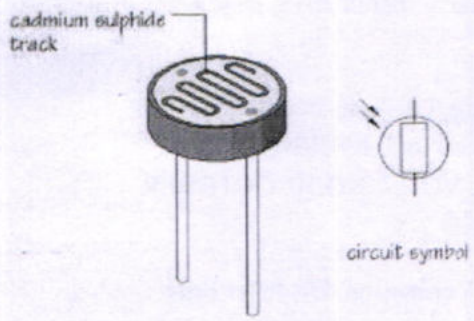
A. Temperature sensor (LM35);



The LM35 –series devices are precision integrated –circuit temperature sensors, with an output voltage linearly proportional to the

Centigrade temperature. The LM35 has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient centigrade scaling. The features of the LM35 make it suitable for many general temperature sensing applications.

B.LDR (Light Dependant Resistor)



LDR sensor has two cadmium sulphite photoconductive cells (cds) with spectral response to that one of the human eye. The cell resistance will fall with the increasing light intensity. Its applications include smoke detection, automatic lightning control system, and batch counting and burglar alarm systems. Light dependent resistors have property to store the lightning conditions in which they have been stored. Light storage reduces equilibrium time to reach steady state resistance values.

C. Ultrasonic sensor (HC-SR04)

It includes ultrasonic transmitters, receiver and control circuit. It provides 2-400cm non contact measurement function. Ranging accuracy may reach 3mm.

The basic working principle of ultrasonic sensor is as follows:

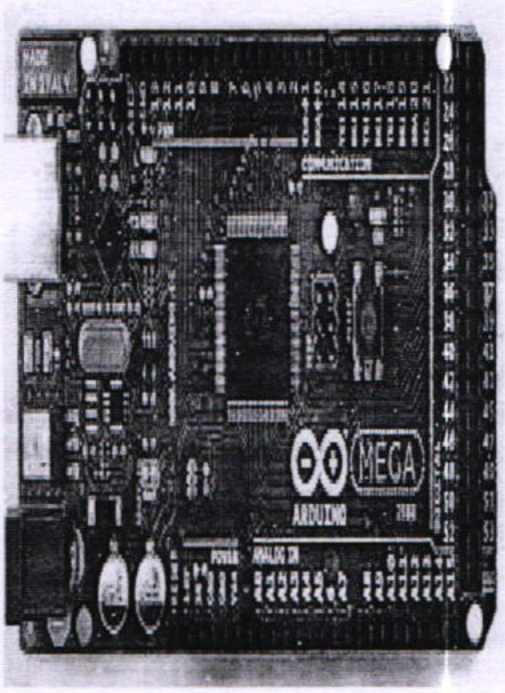
a) Using ten trigger for at least 10us high level signal.

b) The module automatically sends eight 40 kHz and detect whether there is a pulse signal back.

c) If the signal back, through high level, time of high output 10 duration is time from sending ultrasonic to returning.

Test distance = (high level time * velocity of sound [340/s]/2)

E. ATmega Atmel 328pu



The ATmega Atmel 328pu is a low-power CMOS 8bit microcontroller based on the AVR enchanced RISC architecture. By executing powerful instructions in a single clock cycle ATmega Atmel 328pu achieves throughputs approaching 1MIPS per MHz allowing the system designer to optimize power consumption versus processing speed. Power saving is the major important factor. It is easy to do coding for the arduino board as various libraries are available to use in the code.

D.MQTT PROTOCOL

In this system use of MQTT protocol has been used because it has advantages over http protocol. This protocol gives faster response output. It has lower battery and bandwidth consumption. It works efficiently enterprise level applications which include transfer data to server or to mobile application. It assures data transmission and efficient distribution. It is suitable for constrained environment than http. It is light weights publishes and subscribe protocol and runs on IP. It is open standard protocol.

5. RULES AND CONCLUSION:

In this project, smart hospital using IOT has been successfully designed. This project is highly energy efficient as it uses arduino board having microcontroller (ATmega Atmel328pu) which having low power utilization. It also uses MQTT networking protocol and helps in power saving.

We do not need to manually turn ON or OFF the switch of the light. It is possible to control the switch from a webpage or mobile application. This system is a time consuming. It will save patient from the risk of "AIR EMBOLISM". It is user friendly system. Maintenance of this project is not costly.

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Pipe Scales and Biofilm Formation Measurement Using Sensors

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Abstract:- **According to the Urban Drinking Water Distribution Systems (UDWDS), safety and security are two important features. People often compromised by a suite of physical, hydraulic, and chemical factors adversely impacting the quality of potable water reaching consumer taps. Scales and biofilm conglomerates (SBC) with sorption of water chemicals and planktonic microorganisms are recognized as underestimated contaminant sources in ageing pipe networks of UDWDS. The main aim of this study was to provide an updated review of processes and factors associated with the increasing the frequency of deteriorated finished water quality as a result of SBC effects in UDWDS. Important synergistic SBC effects on finished water quality were identified as: Those containing the chemical release from pipe scales due to biofilm-induced alterations at the pipe surface/water interface. The synergistic SBC action on promoting increased release rates of toxic chemicals or pathogens into the water. The microbial enhanced corrosive phenomena on pipe scales and their constituents.**

***Keywords*: Biofilms, Drinking water, Environmental health, Exposure, Pipe scales, Urbanization.**

I. INTRODUCTION

Unsafe water sanitation and hygiene is one of the top4 leading global risks for the burden of disease measured in disability-adjusted life years (DALYs) (4% of global DALYs), along with alcohol use and unsafe sex (5% each), and underweight (6%) (WHO, 2009). Globally, unsafe water sanitation and hygiene is by far the leading environmental risk for morbidity when compared with other environmental factors, such as urban outdoor air pollution, indoor smoke from solid fuels, environmental lead exposure, and global climate change (WHO, 2009). Despite improvements in sanitation and hygiene via access to centralized water treatment facilities and advances in water treatment technologies, i.e., reverse osmosis, it is widely accepted that human exposures to waterborne pathogens and episodic events of chemicals release in finished water of urban drinking-water distribution systems (UDWDS) are of considerable magnitude (NRC, 2006; Edwards et al., 2009). Since 1982, the number of waterborne outbreaks in community water systems has been steadily declining in the United States, while the % contribution of DWDS to the overall frequency of waterborne outbreaks is steadily increasing to > 60%. The number of annual waterborne outbreaks may be actually exceeding current estimates, based on the U.S. Government Accountability Office report highlighting the alarming number of health-related breaches in drinking-water going unreported (U.S. GAO, 2011). The drinking water directive (98/83/EC) is currently under scrutiny by EU scientific experts and stakeholders on whether extensive revision is necessary (Jørgensen et al., 2008).Points of water use (home taps, bottled water, etc.) and points within UDWDS (nearly equally in magnitude) represent the two most frequently occurring deficiencies associated with waterborne disease and outbreaks (Lianget al., 2006; Yoder et al., 2008). Growth of pipe SBC coupled with sorption of water chemicals and planktonic microorganisms by SBC has been increasingly recognized as underestimated contaminant sources in UDWDS (Lytleet al., 2004).

II. FACTORS INFLUENCING PIPE SCALE FORMATION

Electrochemical surface corrosive phenomena coupled with dissolution and/or precipitation reactions of metal salts have been primarily charged with induction of pipe scales, pits, tubercles, and nodules formation, often leading to water discoloration (McNeill and Edwards, 2001). In the past, water utilities had relied upon the Langelier index to predict onset of corrosive events in UDWDS associated with leaching of lead, zinc, and copper from brass, bronze, soldered joints, and their respective pipe materials, but this

approach was shown to be largely misused. and it was eventually abandoned(AWWA, 1996; Schock and Lytle, 2010).1486 K. C. Makris et al. Depending on the pipe material, various pipe scales have been observed to form in UDWDS. In non-chlorinated water flowing through cast iron pipes, α-FeOOH and calcium carbonate were the primary minerals that comprised pipe scales, while α-FeOOH and magnetite were observed as pipe scale constituents in chlorinated water (Wang et al., 2012a). Pipe scales from cast iron pipes in contact with chloraminated water were shown to be composed of calcium phosphate and α-FeOOH (Wang et al., 2012a). The source of treated water flowing through old unlined cast iron pipes exerted a major influence on the composition of formed pipe scales, since thick tubercles with >1 magnetite: goethite ratio were formed that contained siderite and green rust when treated surface water was flowing through the pipes, whereas in the case of ground water, thin hollow tubercle shells with <1 magnetite: goethite ratio were formed (β-FeOOH, γ - FeOOH) (Yang et al.,2012). In addition to goethite, lepidocrocite, and magnetite, three different type of green rust were found in pipe scales formed on cast iron pipes, including the least stable chloride form of green rust despite the notion that green rusts were not present in drinking water pipe scales (Swietlik et al.,2012). Porous deposits of iron oxide or oxyhydroxide phases, including magnetite, goethite, and lepidocrocite, formed a shell-like dense layer at the scale–water interface, while a highly porous phase was observed near the pipe surface of galvanized steel or cast iron (Sarin et al., 2001; Lytle et al.,2005Manganese scales were observed to form within iron tubercles of iron pipes, while a brittle thin manganese oxide that was relatively easy to detach was found in PVC pipes(Cerrato et al., 2006).Water pH may exert a major influence on pH-dependent speciation of carbonic acid, thus, affecting CaCO3 deposition and scale formation(Hodgkiess, 2004); a pH increase from 8.8 to 10.0 could increase CaCO3deposition from 2 mg cm−2 to 12 mg cm−2 in 2 hrs (Andritsos and Karabelas, 1999). A combination of temperature and pH effects increased CaCO3deposition by five times when pH increased from 7.0 to 8.0 at 70◦C temperature(Dawson, 1990).

Oxidation of pipe metallic constituents could be facilitated by the presence of disinfectant agents such as chlorine; lead corrosion products consumed chlorine, facilitating formation of a more stablePbO2 scale, but its rate of oxidation by chlorine was diminished in the presence of high concentrations of carbonate ions (Liu et al., 2009), or addition of orthophosphate to chlorinated water (Lytle et al., 2009), or natural organic matter that was shown to inhibit formation of cerrussite in lead pipes, forming amorphous films (Korshin et al., 2005). Phosphate addition as corrosion inhibitor has been widely used in UDWDS, particularly for lead pipe Pipe Scales and Bio films in Drinking-Water Distribution Systems 1487network systems (Edwards and McNeill, 2002; McNeill and Edwards, 2002).Natural organic matter indirectly influences pipe scale formation, because of its affinity to form soluble complexes with primary pipe scale constituents, such as Fe and Al (Campbell and Turner, 1983). Lower molecular weight organic acids (fulvic acids) could form soluble complexes with metals, like copper in finished water, minimizing the formation of pipe scale precipitates.

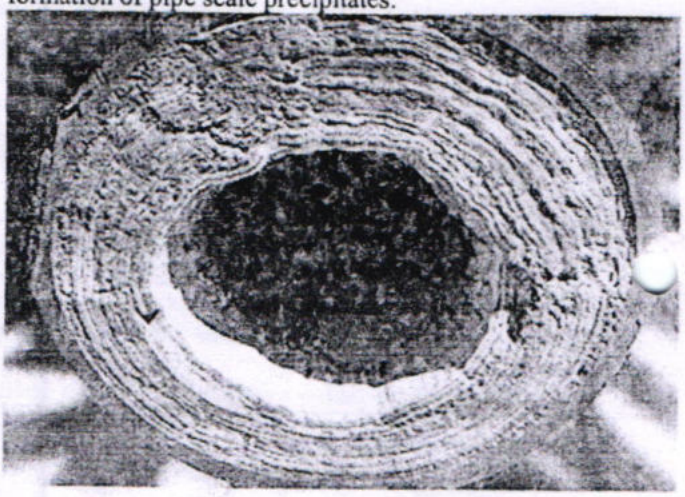

Fig.1.1: Formation of pipe scales

III FACTORS INFLUENCING BIOFILM FORMATION

Bio film formation may be influenced by factors, such as magnitude of residual concentration of disinfectant agent, establishment of conditioning film, bio availability of inorganic nutrients in finished water, hydraulic conditions, pipe material type and surface properties, water flow velocity, water pH, and water temperature (Norton and LeChevallier, 2000; Van der Kooij andVeenendaal, 200 Microbial growth rates are generally slower in a bio film colony when compared with those of planktonic cells. The bio film environment though, can offer a protective environment for anchored microbes against the action of disinfectants used (Van der Wende et al., 1989). The biofilm environment is believed to protect cells against the activity of chlorinevia diffusional resistance and neutralization of chlorine when in contact with EPS constituents (e.g., alginate) and pipe material (Van der Wende et al.,1989).A prerequisite of bio film formation is the establishment of a conditioning film used by planktonic bacteria to sorb onto pipe surfaces (Bakkeret al., 2004). Conditioning films are formed through the adsorption of proteins, lipids, nucleic acids, and other natural surface active agents onto pipe surfaces. EPS production is instrumental towards biofilm

stability and integrity(Vandevivere and Kirchman, 1993; Danese et al., 2000). In P. aeruginosa bio films, production of EPS such as the capsule-like polysaccharide called alginate could down regulate flagellum synthesis and therefore motility(Garrett et al., 1999), turning the bacteria from a motile to a mucoid phenotype(Hentzer et al., 2001). This mucoid conversion is indicative of the overproduction of alginate, which could either facilitate bacterial adherence to pipe surfaces, or it could serve as a barrier to phagocytosis, or as a reactant to neutralize oxygen radicals (Hentzer et al., 2001). A mucoid strain could develop a more structurally heterogeneous bio film than that produced by a comparable non-mucoid strain (Hentzer et al., 2001). Increases in metal divalent cation concentrations (calcium) in bio film growth medium significantly increased bio film production for Pseudomonas spp. (Turakhia and Characklis, 1989). It was speculated that Ca2+ ions formed complexes with alginate, producing a gelly-type of external surface, offering enhanced stability to bio film structure (Chen and Stewart, 2002). Iron pipe constituents could also provide essential nutrients in water for microbial growth, including organic carbon, phosphorus, and nitrogen (Mortonet al., 2005). The adherence of surface active biomolecules to pipe surfacesnot only improved access of bacteria to nutrient media, but also perturbedpipe surface properties, such as hydrophobicity and roughness (Beveridgeet al., 1997; Bakker et al., 2004). Although certain authors reported that microorganisms attached to a greater extent onto hydrophobic rather than ontohydrophilic surfaces (Flemming and Wingender, 2001; Donlan, 2002), it was suggested that the affinity to hydrophobic surfaces could be additionally ascribed to the nature and surface properties of attached bacterial strains (Bakker et al., 2004). Microorganisms undergo vast changes during their transformation from planktonic cells to adhered cells on pipe surfaces. In biofilm colonies, bacteriat end to adapt to environmental changes via gene expression mechanisms(Costerton, 1999; Donlan and Costerton, 2002). In P. aeruginosabiofilms, patterns of genetic differentiation showed that 40% of proteins incellular walls were different from those of planktonic cells (Potera, 1999);

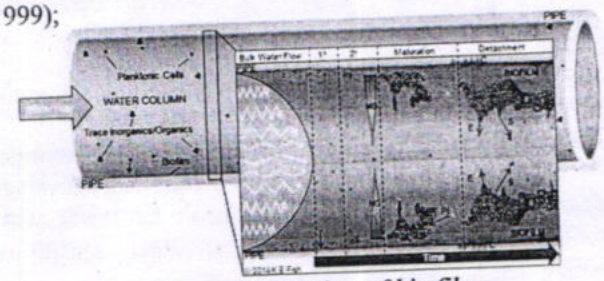

Fig 1.2 Formation of bio films

such changes were reflected upon the new phenotypic characteristics developed by bacteria in bio films due to various environmental stimulating signals(O'Toole and Kolter, 1998). Pseudomonas aeruginosa and P. fluorescens willeasily form bio films under nearly all environmental conditions (O'Toole and Kolter, 1998), whereas certain strains of Escherichia coli K-12 and Vibriocholerae will not form bio films in minimal medium, unless supplemented with amino acids (Pratt and Kolter, 1998; Watnick et al., 1999).Cell hydrophobicity better explained surface adhesion to polystyrene surfaces than less hydrophobic bacterial cells (Van Loosdrecht et al., 1987).Tendolkar et al. (2004) investigated Esp, a surface protein in Enterococcusfaecalis which had been reported to regulate bacterium's surface adhesion potential. Esp positive strains were more hydrophobic and attached better to polystyrene, polypropylene, and PVC surfaces than Esp negative strains, confirming the positive relationship between cell hydrophobicity and pipe surface attachment potential. It has been also demonstrated that both the presence of flagella per se and flagellar motility could positively influence bacterial attachment to surfaces (Donlan, 2002; Klausen et al., 2003; Lemonet al., 2007). Although fimbriae do not directly participate in bio film formation, their presence promotes the process of bacterial adhesion to surfaces(Inoue et al., 2003) probably by overcoming the initial electrostatic repulsion barrier that exists between the cell and substratum (Corpe, 1980).The effect of various pipe material types on the growth of bio films has been widely studied, suggesting lower bio film growth rates in plastic pipes. For example, plastic materials supported the growth of bio films, but the growth in plastic pipes was the same, if not lower than that in iron, steel, or asbestos/cement (Niquette et al., 2000; Zacheus et al., 2000). Biofilm growth in UDWDS was significantly lower on polymeric materials (PE, PVC, and Teflon) than that of iron metallic pipes, such as gray iron, cast iron, galvanized steel, cemented steel, cemented cast iron, or asbestos/cement (Kerret al., 1999; Niquette et al., 2000; Momba and Kaleni 2002). The enhance biofilm growth in metallic pipes versus those in plastics was partially attributed to the formation of iron corrosion products that served as physical protective barrier of biofilm communities against the effects of increased flow rates and residual disinfectant concentration. Van der Kooij and Veenendaal(2001) and Clark et al. (1994) observed that biofilm formation was enhanced in PE > PVC, while others concluded no significant difference in colonization magnitude and rates between PE and PVC materials (Pedersen, 1990;Zacheus et al., 2000; Wingender and Flemming, 2004). Chan (2003) found that biofilm re growth on pipes made of rough surface materials such as cast iron, concrete-lined cast iron, and galvanized steel was greater than that on smooth-surface PVC pipe. Lehtola et al. (2004)

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used phospholipid fatty acid analysis to show higher number of gram-negative bacteria in biofilm established on copper pipe than on PE pipes, but there was no significant difference in biofilm formation between copper and PE pipes after 200 days of reaction. Pipe material can also influence composition and biomass density of attached microbes (Schwartz et al., 1998; Niquette et al., 2000; Lehtola et al.,2005; Silhan et al., 2006; Zhou et al., 2009). Piastic materials, such as polyethylene(PE) and PVC, rapidly colonized (within a few days) in significantly higher densities than those observed for steel and copper (Schwartz et al.,1998). Fewer bacteria have been shown to attach to copper pipes compared with stainless steel pipe material (Zhou et al., 2009), and this perhaps could be attributed to the toxic effect that soluble copper ions impart upon several bacterial species. Lehtola et al. (2004) reported that the formation of biofilm was slower in copper pipes than in PE pipes, and that copper ions led to lower microbial numbers in water. Van der Wende et al. (1989) suggested that at increased flow rates (15 cm hr−1) when compared with lower flow rates(4.5 cm hr−1), nutrient availability was greater, thereby enhancing biofilm cell growth rates (0.006 hr−1). The observed increase in counts of planktonic cells in flow systems was not related to a higher cell growth rate, but to higher cell detachment from adhered bacteria (Van der Wende et al., 1989;Manuel et al., 2007). Nevertheless, at flow velocities as high as 3 m cell detachment increased, thus, adversely impacting biofilm growth rates (Cloeteet al., 2003).

The anticipated pH effect on bacterial attachment and biofilm formation seems to be organism dependent. Certain microorganisms, such as Xylellafastidiosa, appeared to be highly sensitive to small pH changes, being able to produce cell aggregation, attach to surfaces, and finally form biofilm atpH 6.8, but not at <pH 6.2 (Wulff et al., 2008). Other typical UDWDS microorganisms, Pseudomonas and Klebsiella, were able to form biofilms under a wider range of pH (3–10); however, biofilm thickness at pH 3 was reduced to 70% of that at pH 8 (platinum wire electrodes) (Stoodley et al.,1997). Depending on the microorganism, finished water temperature effects on biofilm dynamics are expressed via the gene activation/deactivation mechanisms, encoding surface adhesion potential (Fitzpatrick et al., 2005; Lemonet al., 2007). The magnitude of surface adhesion force is usually based upon measurements of Lifshitz–van der Waals and electrostatic acid–base forces (Smets et al., 1999; Gallardo-Moreno et al.,2002a, 2002b).

IV. DESTABILIZATION OF PIPE SCALESCHEMICAL RELEASE

That the design of the new non adhesive material are on the ease with which the initially adhering microorganisms are detached rather than initial microbial adhesion. The differences in detachment rates between rubber and stainless steel on the basis of stronger attachment to rubber was explained by Smoot and Pierson in 1998.the same studied showed that cell detachment from rubber was not significantly affected by growth pH, but by temperature. Surface roughness with rougher surfaces showing less cell detachment can also affect Cell detachment. processes such as secretion, shedding of cell surface material, cell lyses, and nutrient sorption processes from the surrounding water environment may control The EPS composition. Cavity formation, which occurs beyond the point of biofil: maturation, can be largely responsible for weaken microbial adhesion. Cells may also communicate via Q which may in turn affect various biofilm processes, the mechanism of gene regulation in which bacteria use chemical signals to monitor their own population density and to control expression of specific genes in response to population density is known as QS. Wild types and Mutants were able to produce biofilms, however, only wild type cells were able to form a mature biofilm in the presence of microcolonies and water channels. Mutants were only able to form monolayers, suggesting that QS in P. aeruginosa was responsible for biofilm differentiation, even though it was not involved in the attachment process.

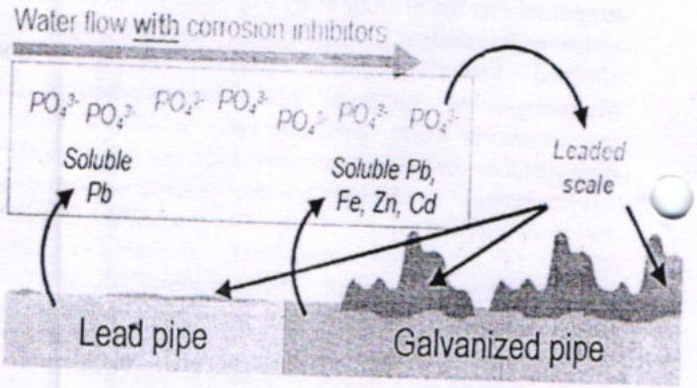

Fig 1.3: Destabilization of pipe scales

An established biofilm provides an optimal environment for the exchange of genetic material between cells, however, the degree of genetic exchange tends to be lower within a biofilm, adversely impacting microbial sensitivity to antibiotics, surfactants, and sanitizers.

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V. BIOFILM EFFECTS ON FINISHED WATER QUALITY

Some of the notable effects of biofilms in UDWDS relate to:

(i) microbial induced corrosion (MIC)
(ii) loss of indicator organism utility
(ii) taste, colour, and odour problems
(iv) disinfectant consumption.

Microbial Induced Corrosion

Corrosion of pipe surfaces represents a major risk factor in physical and hydraulic integrity of UDWDS. The main factors influencing pipe surface corrosion are pipe material type, water corrosivity, the soil/water quality external to pipe, and microbial activity in the pipe biofilm. Over time, corrosion may become serious enough to restrict water passage, causing accelerating biofilm formation and pipe breaks.

Loss of Indicator Organism Utility

A pipe biofilm structure may compromise the effectiveness of total coliform tests as an indicator of drinking-water quality in two major ways. First, a high level of heterotrophic bacteria in pipe biofilm and suspended sediment particles may interfere with the analysis of total coliforms. Second, biofilm coliforms could detach into finished water, resulting in coliform-positive samples, a coliform-positive test under the aforementioned conditions could suggest growth of other microbes as well, including opportunistic pathogens.

Taste, Colour and Odour Problems

Water discoloration, taste and odour issues, may result from a number of reactions, some of which are microbial mediated. The types of microbes often associated with aesthetic issues in drinking water are, iron and sulphur bacteria. Sulphate-reducing bacteria were found within the structure of iron and copper corrosion scales in UDWDS and they were associated with taste complaints to elevated sulphides and the visual coloration of finished water, one general cytotoxin which inhibits protein synthesis (cylindrospermopsin), and a group of toxins termed microcystins that inhibit protein phosphatases (Chorus and Salas, 1997).

Disinfectant Consumption

Biofilms react with chemical disinfectants thus decreasing residual disinfectant concentration in water available for planktonic pathogen inactivation. An extensive biofilm may decrease disinfectant levels to minimum, rendering it inadequate to protect the public from waterborne outbreaks. Use of chloramines as a disinfectant often results in faster disinfectant decay due to nitrification in lead pipes. Nitrification-induced pH drop could increase Pb leaching from lead pipes depending on the magnitude of initial alkalinity and activity of nitrifying bacteria. Disinfectant decay was noted with water age, particularly in chlorinated simulated water distribution systems, resulting in increased microbial detection frequencies and densities with water age. Chlorine contact with bacterial exopolymeric.

VI. BIOFILMS IN UDWDS AND HEALTH RISKS

Public health threats associated with biologic agents in UDWDS typically refer to bacteria, viruses, protozoa, invertebrates, algae and algal toxins, fungi and microbial toxins. All known exposure pathways, such as ingestion of contaminated water, inhalation of contaminated aerosols, and dermal absorption during washing, showering, and bathing, are under consideration in a comprehensive human exposure assessment for chemicals/toxins and pathogens found in home taps of urban consumers. Diarrhea is the main end point of disease used to calculate the percent contribution of lack of access to safe water sanitation and hygiene to the overall morbidity and mortality figures, but in recent years, other outcomes related to the presence of chemicals/toxins emerge, hinting towards additional contributors/risk factors that could be accounted for in the pertinent burden of disease calculations. schools, hospitals, and other health care facilities as biofilm-borne pathogens, could considerably contribute to water-associated nosocomial infections.

VII. IMPLEMENTATION

In our proposed method, Raspberry PI B+ is used as a core controller. The raspberry pi is run on LINUX kernel by the use of keyboard and monitors the LINUX OS is boot on to the Raspberry PI. The temperature sensor, conductivity sensor, turbidity sensor, dissolved oxygen sensor, Ph sensor can be read directly from the command line.

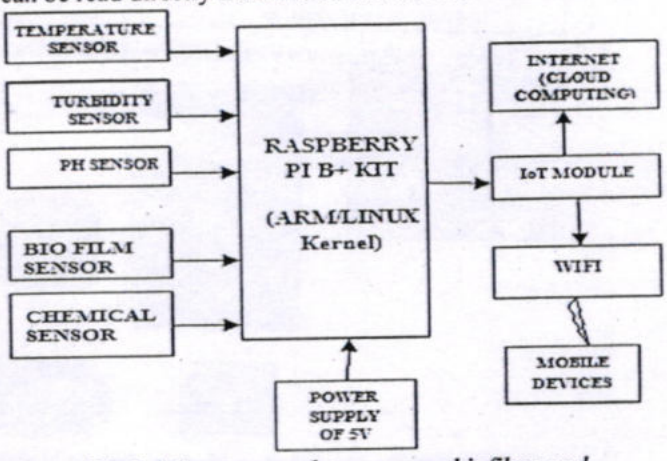

Fig 1.4:Sensors used to measure biofilms and contamination in water pipes

However, this requires us to input a command every time we want to know the sensors reading. In ordered to access all the terminals of the sensors, python program is used, which will read the sensors value automatically at set time intervals. The Raspberry Pi comes equipped with a range of drivers for interfacing. However, it's not feasible to load every driver when the system boots, as it will increase the boot time significantly and use a considerable amount of system resources for redundant processes. These drivers are therefore stored as loadable modules and the command modprobe is employed to boot them into the Linux kernel. Then Raspberry Pi sends the data to the IoT. The IoT module send the data to internet using cloud computing and also to WIFI for accessing mobile devices. The hardware circuit diagram for connecting iot module (USR-WIFI232-X-V4.4) with Raspberry Pi is shown in figure 2. Figure 2: Circuit diagram for connecting core controller to IoT module Then the monitoring parameters of the water from the sensors are transmitted through IoT module to the gateway. The gateway is responsible for data analysis and forward sensing data to the remote server. The server collects sample data by receiving the UDP packets containing sample data from the IoT module and gateway and store in database. By using a separate IP address we can view the sensor data anywhere in the world.

Sr no.	Parameter	Technique used	WHO standard	Indian Standard
1	Temperature	Thermometer	-	-
2	Color	Visual color kit	-	5 Hazen units
3	Odour	Physiological sense	Acceptable	Acceptable
4	pH	pH meter	6.5 – 9.5	6.5 – 9.5
5	Dissolved oxygen	Redox titration	-	-
6	Total Hardness	Complexometric titration	200 ppm	300 ppm

Table 1.1: Parameters affecting water quality

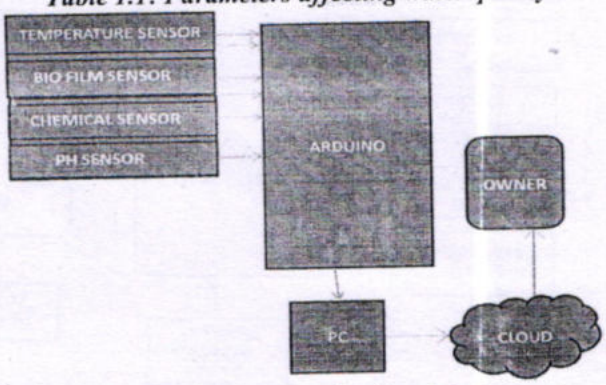

Fig 1.5:Delivering contamination data to owner

VIII. CONCLUSION

A biofilm is a collection of organic and inorganic, living and dead material collected on a surface. It may be a complete film or, more commonly in water systems, small patches on pipe surfaces. Biofilms in drinking water pipe networks can be responsible for a wide range of water quality and operational problems. Biofilms can be responsible for loss of distribution system disinfectant residuals, increased bacterial levels, reduction of dissolved oxygen, taste and odor changes, red or black water problems due to iron or sulfate-reducing bacteria, microbial-influenced corrosion, hydraulic roughness, and reduced materials life. Microorganisms in biofilms can include bacteria (including coccoid round, rod-shaped, filamentous, and appendaged bacteria), fungi, and higher organisms like nematodes, larvae, and Crustacea. Therefore, it is important to thoroughly flush thedistribution system to remove these organisms following a contamination event.

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Phishing: Threats & Challenges

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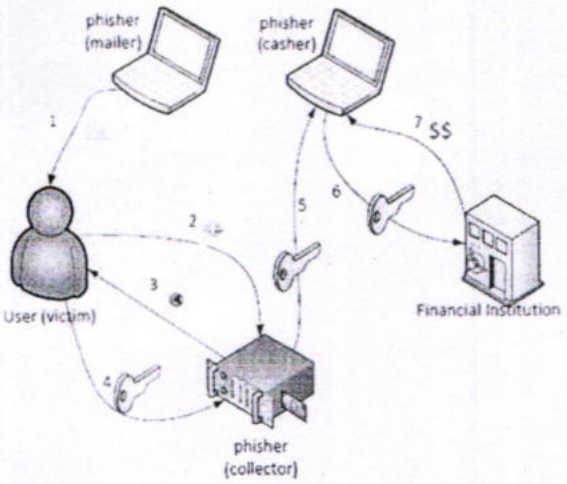
Abstract:- **Cybersecurity is the body of technologies, processes and practices designed to protect networks, computers, programs and data from attack, damage or unauthorized access. Cyber-crime is emerging as a serious concern. To the world of computer technology which is evolving ever so fast the government, police and intelligence units are taking this issue very seriously. The world of cybersecurity is not a small term it deals with the threats such as Phishing, Eavesdropping, spoofing, tampering, Clickjacking, Hacking. In this paper, we are going to deal with the challenges regarding phishing. Phishing is derived from two words "Password harvesting" which means fishing for passwords. It is an attempt of acquiring sensitive information such as usernames, passwords, and credit card details directly from users. Phishing is typically carried out by email spoofing or instant messaging, and it often directs users to enter details at a fake website whose look and feel are almost identical to the legitimate one. Preying on a victim's trust, phishing can be classified as a form of social engineering. Phishing is a general term which deals with several subtypes which are discussed further in the paper. Phishing is further classified into Spear phishing, Whale phishing, and Clone phishing. The threats of phishing have confronted us with several challenges concerning with security of data, vulnerability inside an organization, holes insecurities in a computer system.**

Keywords: **Spear phishing, Whale phishing, Clone phishing**

I. INTRODUCTION

Now a day's attacks had become major issues in networks. Attacks will intrude into the network infrastructure and collect the information needed to cause vulnerability to the networks. Security is needed to prevent the data from various attacks. Attacks may either be active attack or passive attack. One type of passive attack is phishing.



Phishing is an attempt of obtaining sensitive information such as usernames, passwords, and credit card details (and, indirectly, money), often for malicious reasons, by disguising as a trustworthy entity in an electronic communication. The word phishing comes from the word "neologism" created as a homophone of fishing due to the similarity of using a bait in an attempt to catch a victim.

Phishing is typically carried out by email spoofing or instant messaging, and it often directs users to another web address where users are made to enter personal information at a fake website, the look and feel of which are identical to the legitimate one and the only difference is the URL of the website. Communications purporting to be from social web sites, auction sites, banks, online payment processors or IT administrators are often used to lure victims. Phishing emails may contain links to websites that are infected with malware. Phishing is also known as brand spoofing or carding. According to the statistics given by Anti Phishing Working Group (APWG) in December 2015, the unique phishing sites detected was 630,494 and the top two countries in phishing hosting site was Belize(81.3%) and USA(76.8%).In this paper we focus on various types of phishing attacks and different anti phishing techniques.

Following the example. Some components, such as multi-leveled equations, graphics, and tables are not prescribed, although the various table text styles are provided. The

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formatter will need to create these components, incorporating the applicable criteria that follow

II. TYPES OF PHISHING

In this section, we give a brief description about the different types of phishing attacks:

A. Deceptive phishing:

It is the messages that are required to confirm information about the account, requesting users to reenter their information, fictitious account charges, unwanted account changes, new free services requiring quick action, and many other malicious sites are send to many recipients with the hope that the unsuspecting will react by clicking a link.

B. Malware-Based Phishing:

This refers to scams that involve running malicious software on users' PCs. Malware can be as an email attachment, as a downloadable file from a web site for a particular issue for small and medium businesses (SMBs) who are not always able to keep their software applications up to date.

C. Key loggers and Screen loggers:

This type of malware tracks the input from the keyboard and the relevant information will be send to the hackers through internet. They go into the users' browsers as a small program and run automatically when the browser is started as well as into system files as device drivers or screen monitors. Session Hijacking: This deals with monitoring the activities of the users until they sign in to the account or transaction and create their important information. At that point the infected software will perform unauthorized actions, such as transferring funds, without the user's knowledge.

D. Spear phishing:

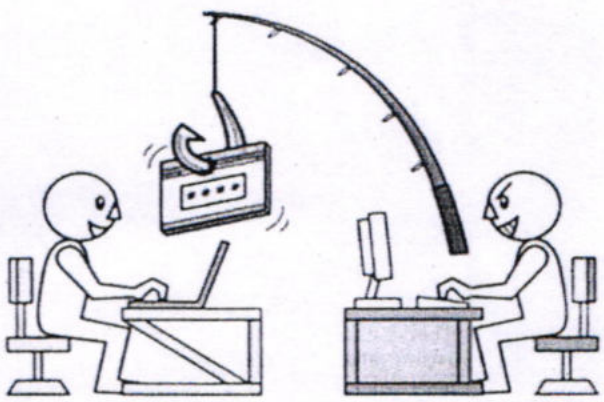
Phishing attempts directed at specific individuals or companies have been termed spear phishing. Attackers may gather personal information about their target to increase their probability of success. This technique is by far the most successful on the internet today, accounting for 91% of attacks.

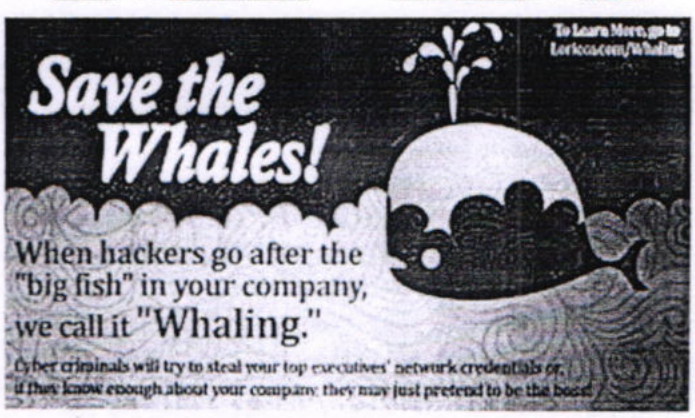
E. Clone phishing:

Clone phishing is a type of phishing attack whereby a legitimate, and previously delivered, email containing an attachment or link has had its content and recipient addresses taken and used to create an almost identical orcloned email. The attachment or link within the email is replaced with a malicious version and then sent from an email address spoofed to appear to come from the original sender. It may claim to be a resend of the original or an updated version to the original. This technique could be used to pivot (indirectly) from a previously infected machine and gain a foothold on another machine, by exploiting the social trust associated with the inferred connection due to both parties receiving the original email.

G. Whale phishing:

Several phishing attacks have been directed specifically at senior executives and other high-profile targets within businesses, and the term whaling has been coined for these kinds of attacks. In the case of whaling, the masquerading web page/email will take a more serious executive-level form. The content will be crafted to target an upper manager and the person's role in the company. The content of a whaling attack email is often written as a legal subpoena, customer complaint, or executive issue. Whaling scam emails are designed to masquerade as a critical business email, sent from a legitimate business authority. The content is meant to be tailored for upper management, and usually involves some kind of falsified company-wide concern. Whaling phishers have also forged official-looking FBI subpoena emails, and claimed that the manager needs to click a link and install special software to view the subpoena.





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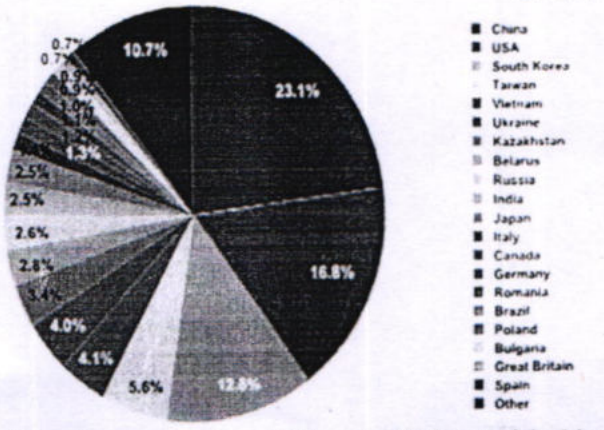
III. PHISHING ATTACKS

2001: The first known direct attempt against a payment system affected E-gold in June 2001, which was followed up by a "post-9/11 id check" shortly after the September 11 attacks on the World Trade Center.

2003: The first known phishing attack against a retail bank was reported by The Banker in September 2003.

2004: It is estimated that between May 2004 and May 2005, Approximately 1.2 million computer users in the United States suffered losses caused by phishing, totaling approximately US$929 million. United States businesses lose an estimated US$2 billion per year as their clients become victims.



Phishing is recognized as a fully organized part of the black market. Specializations emerged on a global scale that provided phishing software for payment (thereby outsourcing risk), which were assembled and implemented into phishing campaigns by organized gangs. 2006: Almost half of phishing thefts in 2006 were committed by groups operating through the Russian Business Network based in St. Petersburg. Banks dispute with customers over phishing losses. The stance adopted by the UK banking body APACS is that "customers must also take sensible precautions ... so that they are not vulnerable to the criminal. Similarly, when the first spate of phishing attacks hit the Irish Republic's banking sector in September 2006, the Bank of Ireland initially refused to cover losses suffered by its customers, although losses to the tune of €113,000 were made good. Phishers are targeting the customers of banks and online payment services. Emails, supposedly from the Internal Revenue Service, have been used to glean sensitive data from U.S. taxpayers. While the first such examples were sent indiscriminately in the expectation that some would be received by customers of a given bank or service, recent research has shown that phishers may in principle be able to determine which banks potential victims use, and target bogus emails accordingly. Social networking sites are a prime target of phishing, since the personal details in such sites can be used in identity theft. In January 2009, a phishing attack resulted in unauthorized wire transfers of US$1.9 million through Experi-Metal's online banking accounts.

IV. METHODS OF PREVENTION

There are anti-phishing websites which publish exact messages that have been recently circulating the internet, such as FraudWatch International and Miller smiles. Such sites often provide specific details about the particular messages. To avoid directly dealing with the source code of web pages, hackers are increasingly using a phishing tool called Super Phisher that makes the work easy when compared to manual methods of creating phishing websites.

As recently as 2007, the adoption of anti-phishing strategies by businesses needing to protect personal and financial 2005: In the United Kingdom losses from web banking fraud—mostly from phishing—almost doubled to GB£23.2m in 2005, from GB£12.2m in 2004, while 1 in 20 computer users claimed to have lost out to phishing in 2005. information was low. Now there are several different techniques to combat phishing, including legislation and technology created specifically to protect against phishing. These techniques include steps that can be taken by individuals, as well as by organizations. Phone, web site, and email phishing can now be reported to authorities, as described below.

A. Browsers alerting users to fraudulent websites:

Another popular approach to fighting phishing is to maintain a list of known phishing sites and to check websites against

the list. Microsoft's IE7 browser, Mozilla Firefox 2.0, Safari 3.2, and Opera all contain this type of anti-phishing measure. Firefox 2 used Google anti-phishing software. Opera 9.1 uses live blacklists from Phish tank, cyscon and GeoTrust, as well as live whitelists from GeoTrust. Some implementations of this approach send the visited URLs to a central service to be checked, which has raised concerns about privacy. According to a report by Mozilla in late 2006, Firefox 2 was found to be more effective than Internet Explorer 7 at detecting fraudulent sites in a study by an independent software testing company.

An approach introduced in mid-2006 involves switching to a special DNS service that filters out known phishing domains: this will work with any browser, and is similar in principle to using a host's file to block web adverts.

To mitigate the problem of phishing sites impersonating a victim site by embedding its images (such as logos), several site owners have altered the images to send a message to the visitor that a site may be fraudulent. The image may be moved to a new filename and the original permanently replaced, or a server can detect that the image was not requested as part of normal browsing, and instead send a warning image.

B. Augmenting password logins:

The Bank of America's website is one of several that ask users to select a personal image (marketed as Site Key), and display this user-selected image with any forms that request a password. Users of the bank's online services are instructed to enter a password only when they see the image they selected. However, several studies suggest that few users refrain from entering their passwords when images are absent. In addition, this feature (like other forms of two-factor authentication) is susceptible to other attacks, such as those suffered by Scandinavian bank Nordea in late 2005, and Citibank in 2006.

A similar system, in which an automatically generated "Identity Cue" consisting of a colored word within a colored box is displayed to each website user, is in use at other financial institutions.

Security skins are a related technique that involves overlaying a user-selected image onto the login form as a visual cue that the form is legitimate. Unlike the website-based image schemes, however, the image itself is shared only between the user and the browser, and not between the user and the website. The scheme also relies on a mutual authentication protocol, which makes it less vulnerable to attacks that affect user-only authentication schemes.

Still another technique relies on a dynamic grid of images that is different for each login attempt. The user must identify the pictures that fit their pre-chosen categories (such as dogs, cars and flowers). Only after they have correctly identified the pictures that fit their categories are they allowed to enter their alphanumeric password to complete the login. Unlike the static images used on the Bank of America website, a dynamic image-based authentication method creates a one-time passcode for the login, requires active participation from the user, and is very difficult for a phishing website to correctly replicate because it would need to display a different grid of randomly generated images that includes the user's secret categories.

C. Eliminating phishing mail:

Specialized spam filters can reduce the number of phishing emails that reach their addressees' inboxes, or provide post-delivery remediation, analyzing and removing spear phishing attacks upon delivery through email provider-level integration. These approaches rely on machine learning and natural language processing approaches to classify phishing emails. Email address authentication is another new approach.

V. CONCLUSION

Phishing is a critical problem that results in a continual threat and the risk is high in social media. Phishing takes advantage of the trust that the user may not be able to tell that the site being visited, or program being used, is not real; therefore, when this occurs, the hacker has the chance to gain the personal information of the targeted user, such as passwords, usernames, security codes, and credit card numbers, among other things. This paper discuss about the various types of phishing attacks and various anti phishing techniques used to prevent phishing attack.

This paper based study revealed that users are vulnerable to phishing-based social engineering attacks indicating that there is still a significant lack of awareness in line with previous findings. An understanding of how to identify a phishing attack cannot be underestimated as current anti-phishing mechanisms may not guarantee the user complete protection. As a result increased user awareness is paramount as a countermeasure against phishing.

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Online Voting System

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Abstract: - **In the existing system till now, the voting is performed by going to the voting centre. During the year 1997 election, election voting machine (ECV) was introduced as a new method of polling, so the main disadvantages of this system are time consumption, risk-oriented process, election expenses etc. We are bringing a new project called ONLINE VOTING SYSTEM. The main feature of this project is to build a website, which allows people to cast their vote online. We are building this project by using software's like ASP.NET as a frontend and SQL SERVER as a backend. The hardware requirements of this project are Pentium 4 processor, 500MB hard disk and ram capacity of 4GB. After the completion of design and coding phase, the next stage in the development of software project is a Testing phase. In the testing phase, the program to be tested is executed with a set of test cases, and output of the program for the test cases is evaluated to determine if the program is performing as it is expected to. The types of testing done here are UNIT Testing and INTEGRITY Testing. Unit testing is a dynamic method for a verification where the program is actually compiled and executed. In Integrity testing, many tested modules are combined into sub-system, which is then tested.**

Key Words- **Website, Online vote**

I. INTRODUCTION

The main concept of this project is to build a website, which should be able to allow people to cast their vote online. Our project provides Authentication, where only authorized voters should be able to vote, Uniqueness that is no voter should be able to vote more than once, Accuracy in which Voting system should record the votes correctly, Verifiability that Should not be able to modify without detections and Transparency in which, Voters should be able to possess a general understanding of the whole process, by providing Online implementation makes it easy for voters to participate in election.

II. PROPOSED SYSTEM

- To build an online system this world enable voters to cast their votes on chosen candidates
- Create a secure authentication facility to check validate users logging into the voting system
- Create a database to be used to stored votes, and user information on the system
- Enable the system to tally votes cast according to candidate voted for
- Create a backend administration section which will be used to enable the administration manage the election system effectively
- Create tools for the administrator to add, delete and update details of voters, candidates and other details in the system
- Timestamp voter cast to the database to know when each vote was cast
- Enable administrators to generate reports on the vote results
- Prevent voting more than once for their choose candidate

III. DESIGN PHASE

3.1 ASP.NET

Net framework is a development & execution environment that allows developers to create windows & web based application. Net framework provides an integrated development environment in which programmers can develop applications in different environment in which programmers can develop application in different programming languages, such as c# & vb.net. The latest version 2.0 release of NWT framework has undergone a long journey since its version 1.0 release.

Net framework 2.0 has built-in functionality have incorporated in the versions to earlier to the growing demands of the developer community. The new release 2.0 further extends the framework by introducing new features & enhancements; the prominent of them begin high availability &developer productivity. Visual Basic.net is a multi-purpose computer programming languages from Microsoft that is suitable for most development needs. The language is designed with Rapid application Development in

mind, providing several tools to shorten development Time. Programmers using the visual basic 2008 languages have the ability to write application ranging from simple user-friendly front-end interfaces.

3.2 MICROSOFT SQL SERVER 2008

SQL SERVER MANAGEMENT STUDIO is a GUI (Graphical User interface) tool includes with SQL Server 2008 & later for configuring managing, & administering all components within Microsoft SQL Server. The tool includes both script editor & graphical tools that work with objects & features off the server.

SQL server Management Studio replaces Enterprise Manager as the primary management interface for Microsoft SQL Server since SQL server 2008. A version of SQL server management studio is available for SQL Server Express edition, for which it is known as SQL SERVER MANAGEMENT STUDIO EXPRESS (SSMSE). Microsoft SQL Server is a relational database management developed by Microsoft. As a database, it is a software product whose primary function is to store and retrieve data as requested by Other software application, be it those on the same computer or those running on another computer across a network (including internet). SQL Server provides a number of tools that serves different purposes, such as installation, database query, and replication. All these tools have user-friendly graphical interfaces SQL Server Management Studio is a completely new application that gives you uniquely interface to manage servers and create queries across all SQL Server components.

IV. HARDWARE REQUIREMENT

- Processor--Pentium4 processor
- Hard disk -500mb
- Ram capacity-4GB

4.1 Software Requirement:

- Operating system- Window 8
- Front End - Asp.net (Visual Studio2010)
- Back End - SQL Server 2008

V. TESTING PHASE

5.1 UNIT TESTING

Unit testing is dynamic method for a verification where the program is actually compiled and executed. It is one of the most widely used methods. The goal of unit testing is to test modules or "UNITS" and not the entire software system in this part of testing the system coding is compiled for every individual forms, classes and modules. every object present in the forms is coding part appropriate code is written . in order to make the object work properly the codes are compiled .after if any error occurs is rectified and made sure that every object in the form is working properly and according.

5.2 INTEGRITY TESTING

When an individual unit code testing is done there starts the integration testing takes places. In this many tested modules are combined into sub-system, which are then tested .the goal here is to see if the modules can be integrated properly, the emphasis being on testing interfaces between modules. This testing activity can be considered as testing the design and emphasis on module in interactions. Then all the compilation is done then an overall application is done which checks one and every object coding, linking etc and finally provides the results as the standard EXE.

VI. ADVANTAGES

- High level Security to avoid illegal polling.
- Online implementation makes it easy for voters to participate in election.
- As for considering election commission board it becomes easier to conduct elections.
- Election expenses can be reduced.
- The online voting provides a less time consuming.
- Fast and easy service.

6.2 DISADVANTAGES

- High manual work load
- There is a chance for re-voting
- Consumes more time
- Election Expenses are more
- Risk oriented process

VII. GOALS

- Authentication- Only authorized voters should be able to vote.
- Uniqueness-No voter should be able to vote more than once
- Accuracy-Voting system should record the votes correctly.
- Verifiability-Should not be able to modify without detections.
- Transparency-Voters should be able to possess a general understanding of the whole process.

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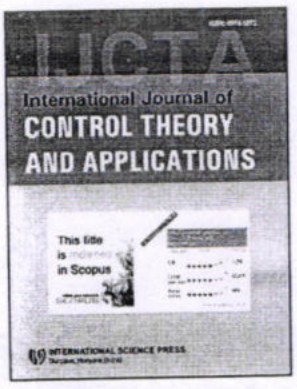

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New Analysis for Identification of Eye Diseases from the Blood Sample Values

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Abstract: In the present day time many different parcel of ailments that can influence ordinary human life. One such illness is called diabetic. This will impact in two cases one is eating routine and the second one is hereditie. Because of this diabetic malady, 80 % of individuals it will begin impact from the eye and afterward remaining body organs like kidney, liver heart, nerves and so forth. So this proposition needs to separate the element of eye. From this element, it will give the anomaly of the proportion in seriousness level insightful. Because of this approach, it will save the vision in early stage itself furthermore it will give the alarm to the rest of the body organs.

This proposition it will begin gathering the constant pictures from the diagnostic centre. These pictures were taken from the fundus camera. These pictures are full of noise, raw and unprocessed pictures. So that, next stride needs to remove the noise from the pictures. In this venture used all different types of filters to remove noise and performance of all the filters are verified using different parameters like SNR (Signal to Noise Ratio), MSE (Mean Square Error), SSIM Similarity Index), RMSE (Root Mean Square Error), PSNR (Peak Signal to Noise Ratio). And after that next is feature extraction. They are veins, microaneysams, exudates, and optic disk for every element it is utilized best picture preparing calculations and afterward at last will gives gentle, direct, seriousness of the diabetic and this outcome is contrasted and glucose level estimation of similar patients. It was co-equal in both contextual investigations.

On this task subsequent changed into completed such a lot of evaluation like each functions regular and peculiar snap shots with their corresponding blood pattern and evaluation equations table and subsequently it turned into plot the graph blood sugar values Vs all of the functions normal and abnormal values. At last this will give straight forwardly eye ailment from the glucose values. So this proposed evaluation of software program will supply greater advantage for opthamologists to discover eye sickness from blood sugar ranges.

Keywords: New filter, Feature extraction, Blood sample values, Eye diseases detection, Corresponding treatment.

1. INTRODUCTION

Illness in membrane resulted from special diseases square measure verifies by special photos from membrane, that square measure obtained by exploitation optic imaging called bodily structure. The inexperienced

channel is high reactive to the blood vessels. The improved median filter [1] is utilized to urge obviate salt and pepper sound from the wicked image. The World Health Organization (WHO) has calculated the quantity of persons with eye diseases inside the globe would increase staggeringly from 100 thirty 5 million in 1995 to 3 hundred million in 2025[6]. Therefore on reduce the unhealthy. Sound effects associated with the method input

Image was pre-processed by a filter, then, the retinal structure image is assessed in to some primary components like Red Channel (R), inexperienced Channel (G) and Blue Channel (B)[7]. And changed filter is introduced to induce still higher performance of noise. that the output is that the raised image a footing is associate sudden amendment within the brightness (gray scale level) of the pixels. The removal of blood vessels in membrane photos is very important step in designation and treatment of diabetic membrane. For unhealthy persons the diameter of the blood vessels could disagree or otherwise there is a chance for growth of latest vessels once connected with ancient person's blood vessels.[8] The blood vessels get encircled for diabetic patients and it gets narrower for illness unhealthy patients. Exudates are one in every of the first signs of membrane ill health, Automatic exudates detection would be useful for diabetic retinopathy screening methodology. On color and sharp edge decisions to look out the exudates. The yellow objects are detected first. The objects within the picture with extraordinarily sharp edges are then found exploitation Kirsch's mask and diverse rotations of it at the inexperienced component. The mix of outcome of yellow objects with very sharp fringe is used to determine out the exudates. The bushy C-manner (FCM) collecting can be a widely known cluster approach for photo partition, many strategies are executed for exudates commentary, and however they must illness. Then improved FCM is employed for higher extraction. Terrible quality pictures have an impression on the separation outcomes of vivid and darkish damage exploitation thresholding and exudates function extraction. Microaneursyms are the first scientific abnormality to be detected inside the eye for diabetic retinopathy they are crimson lesions. Crimson lesions are the first clinically obtrusive injury indicating diabetic retinopathy. Therefore, their detection is essential for a pre-screening gadget [13]. The motive is that the shining 0.five within the widespread images in an effort to be seen as light, round or vertically memory device is that the rein where blood vessels and cranial nerve fiber enter to the membrane of human eyes. Its miles the shining a place of the standard complicated frame component pictures. Observation of the point (OD) is taken under consideration united of the essential part of examine of virtual color retinal snap shots [19]. In our deliberate gadget watershed rule is hired for the optic discs detection and for this reason the severity of the attention sicknesses is examined. Supported the output results of those 4 extractions we find out the severity of the unwellness as mild, mild or significantly affected.

1.1. Materials & Techniques

All of the 110 pictures are utilized on this paper are received from the govt. health facility real time patients. There are associate in retinal colour complicated frame part pix with a range length of 4 hundred × 600 x 3 pixels, together with the cranial nerve contours derived by 2 specialists.

2. PLANNED SYSTEM

The planned system consists of 4 stages. Initial stage is collection the pictures of patients by fundus camera. This can be raw pictures and contains choked with noise. This noise is detected by filters. Modified filter is employed from the mean, median and improved median filter and modified filter for the removal of error caused whereas taking of the image and to scale back the noise and next stage is the extraction of options of eye like veins, Exudates, Microaneursyms and optic discs by image process algorithms. They are brandy edge detection rule, modified fuzzy cluster rule, morphological distance based rule and watershed rule and at last fourth stage is comparison between blood sample results and segmented results. The planned system for detection of eye diseases is illustrated in Fig. 1.

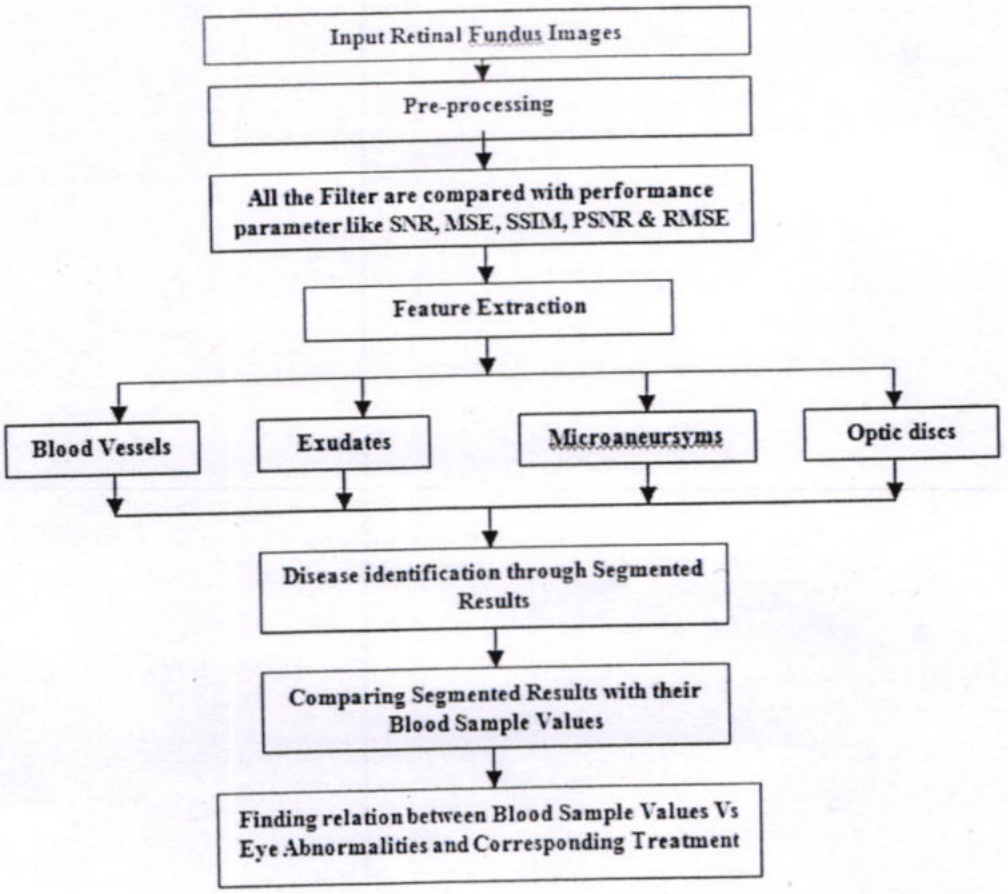


Figure 1: Planned System for eye diseases detection.

Stage 1: Assembling real time patient's pictures from the hospitals. These pictures square measure taken by structure camera. This can be packed with noise and raw pictures. Those noises are often reduced within the second stage victimization filters.

Stage 2: PREPROCESSING: The pre-processing step removes difference due to image gain, such as in homogeny. The illumination Techniques such as morphological operations are trying to the input image. The following session's complex the modified filter developed from the mean, median, improved median and modified filters that can be used in pre-processing stage in this paper.

2.1. Modifed Filter

To remove salt and pepper noise from the corrupted image with additional algorithms is employed. The output of all the filters square measure compared with modified filter for the given input retinal pictures and additionally compared the performance of image with SNR(Signal to Noise Ratio),MSE(Mean Square Error), SSIM(Similarity Index) ,RMSE(Root Mean Square Error), PSNR(Peak Signal to Noise Ratio). Quantitative relation conjointly finally modified filter gave best results compared to different filters. Modified filter is a combination of three filters mean filter, median filter and improved median filter (Gaussian, Speckle, Salt and pepper noise) Each pixels value of the image is replaced by theaverage value of similar patches all over the image. The algorithmic program is given below.

- A color image is taken for experiment purpose.

- The color image is converted into gray image.
- Mixed noise image is obtained by adding three different noises (Gaussian, speckle, salt and pepper noises) at zero mean and different variances.
- Mixed noise is filtered first by mean filter.
- Mean filtered image is filtered by median filter.
- Median filtered image is filtered by improved median filter.
- Each pixels value of improved median filtered image is replaced by the common the average value patches everywhere the image.
- Denoised image may be a gray image therefore its regenerate into color RGB image. This is often the ultimate Denoised image.

Stage 3: FEATURE EXTRACTION- BLOOD VESSELS EXTRACTION: The observation of blood vessels from the retinal pictures may be a tedious method. In our planned algorithmic rule, Kirsch's model is employed for detection the blood vessels from the retinal pictures. For kirsch edge detection, the edge image (i.e., detected edges) is considered the area gradient. The kirsch gradient operator is chosen to extract the contour of the article. The kirsch edge detection uses eight masks (i.e., eight masks for connected eight main directions) that are applied to given image to find edges. Except the outmost row and also the outmost column, each component and its eight neighbourhoods in an exceedingly given image are convolved with these eight templates. Each component has eight outputs. And also the utmost output of the eight templates is chosen to be the value in given position. This can be outlined because of the edge magnitude. The direction of edge is outlined by the connected mask. The ultimate gradient is that the summation of the improved edges by considering all directions for RGB channel instead of any single channel. Here, numerous directional enhanced pictures are presented. This feature extraction is compared with all the algorithms .Finally our planned algorithmic rule given correct results.

2.2. Exudates Extraction

Exudates are tiny yellow white patches with sharp margins and totally different shapes. Exudates are one among the first occurring lesions. Exudates are accumulations of lipoid and macromolecule within the membrane. Generally they are bright, reflective, white or cream coloured lesions.

Fuzzy cluster is Associate in nursing overlapping cluster formula, where each purpose might belong to loads of or two clusters with completely different degrees of membership. The choices with shut similarity in an exceedingly image unit of measurement classified into constant cluster. The similarity is made public by the gap of the choices vector to the cluster middle. Geometrician distance is used to measure this distance Associate in nursing data are attending to be associated to associate degree applicable membership value. The cluster middle is updated until the excellence between adjacent objective perform, is close to zero or abundant however a predefined terribly little and constant. to prevent that our formula gets treed in minima, the MFCM formula is initialized with the upper than quick FCM algorithm. Once the quick FCM is stopped, the MFCM formula follow it with the values for the prototypes and membership values obtained from the short FCM formula. The MFCM formula then iteratively updates its a priority chance, membership and centroids with these values. Once the MFCM formula has converged, another defuzzification technique takes place thus on convert the fuzzy segregation matrix to a crisp segregation matrix.

Thus the MFCM algorithm is given as follows:

Step 1: Set the cluster centroids vi in line with the bar chart of the image,

Step 2: Calculate the bar chart exploitation

Step 3: Calculate the membership operate exploitation

Step 4: Calculate the cluster centroids

Step 5: Hold to step 3 and repeat until convergence.

Step 6: work out the a priori chance with the obtained results of membership operates and centroids.

Step 7: Recomputed the membership operate and cluster centroids and therefore the possibilities.

Step 8: If the formula is merging, attend step 9; otherwise, attend step half-dozen.

Step 9: Image distribution when defuzzification then a part labelling procedure is performed.

This feature extraction is compared with all the algorithms. Finally our projected formula given correct results.

2.3. Microanerusyms Extraction

Microaneurysms on the membrane seem as tiny red dots of most size to be less than the diameter of the most important optic veins. The recognition of microaneurysms is crucial in the operation of diabetic retinopathy grading, since it forms the premise of deciding whether or not Associate in Nursing image of a patient's eye ought to be thought-about healthy or not.

2.4. Morphological Distance Primarily Based Algorithm

Microaneurysms area unit tiny saccular pocket caused by native distension of capillary walls and seem as tiny red dots. Their walls area unit skinny and rupture simply to cause haemorrhages. To discover visible small aneurysms in membrane exploitation size and form automatic small aneurysms detection and diabetic retinopathy grading and Hough transforms area unit gift however the morphological distance primarily based algorithmic rule for Microaneurysms is effective and also the steps concerned as shown below.

Step 1: The pre-processing step filters the image, will increase the distinction and performs a shading correction so as to balance the non-uniform illumination across the image. The diameter-closing step could be a mathematical morphological transformation that fills all told the black dots with diameters smaller than λ.

Step 2: once acting such closing transformation, the grey-scale worth of the filled-in dots is over within the increased pre-processed image, whereas the vessels and alternative components stay nearly unaffected. The black top-hat step uses size and form criteria to isolate the black elements contrasted against the background.

Step 3: The black top- hat remodel is that the results of the distinction between the photographs obtained by the dimensions closing and pre process steps. The automatic threshold step identifies all components within the black top-hat image that area unit potential μA candidates.

Step 4: Finally a K-nearest neighbours (k -NN) classifier is employed for classification. It uses the Properties calculated for the candidates to seek out them as either true μA or false positives supported the educational set within the tiny information. The classifier acts sort of a human critic by taking into consideration factors like size, contrast, roundness, grey-scale level and color. Then actuality microaneurysms area unit detected.

2.5. Optic Disc Extraction

Optic disc is that the brightest a part of the tissue layer and it's in oval in form and for diabetic retinopathy affected person the oval structure is irregular in structure.

2.6. Watershed Transformation

An implementation of the watershed rework was bestowed by Vincent & Soille. Since we wish to debate this implementation in some detail, we tend to reproduce their rule here in pseudocode, during this rule there area unit 2 steps:

Step 1: Sorting the pixels w.r.t. increasing gray worth, for direct access to pixels at an explicit gray level;

Step 2: A flooding step, continued level by level and ranging from the minima. The implementation uses a accounting queue of pixels, that is, a _rst-in-_rst-out system on it the following operations is performed: CFO add(p; queue) adds element p at the tip of the queue, CFO remove(queue) returns and removes the erstwhile element of the queue, CFO init(queue) initializes associate empty queue, and CFO empty(queue) is also a make certain returns true if the queue is empty and false otherwise.

3. SEGMENTATION AND RESULT

We enforced our planned technique exploitation Matlab and applied more than 50 images of normal and abnormal patients .The modified filter is enforced for denoising of extremely corrupted pictures and edge prevention. The kirsch edge detection rule works well for the pictures having clear distinguish between the foreground and background, since the retinal blood container is thought of as needed foreground data for fundus pictures kirsch rule is effectively register. Exudates are one in every of the foremost factor of diabetic retinopathy and responsible for liable for hazy views and visual defect fuzzy cluster algorithms is employed for the extraction of exudates once this Microaneursyms are first clinical abnormality to be noticed in eye. The red lesion is detected by the morphological distance based mostly algorithms. The bright portion of the anatomical structure image is optic discs that could be a pale, spherical or vertically slightly oval form disk circular region from wherever the blood vessels emanate is known as the blind spot.

Based on the top of the results, here we tend to get the formula. That may offer the relation between blood glucose level Vs retinal diagnosing options

ie. Only 1 Feature = 90 to 130 mg/dl

2 Features= higher than 130 to 180 mg/dl

Any 3 Feature = above a hundred and eighty to two hundred mg/dl

All four features = on top of two hundred mg/dl

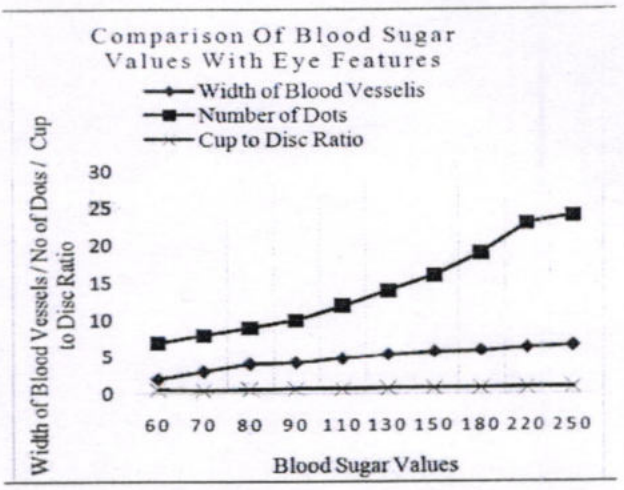
During this step compared the patient retinal image segmental results with the patient blood glucose values exploitation blood glucose machine. This can provides the severity of the sickness and additionally performance of the segmental results. This comparison is illustrated only for nine patients in the table1 which table represents patient name, blood glucose values, retinal image, segmental results of retinal image and severity. Finally so much case study was done on individually each eye features in terms of the blood sample values. That relationship between each feature normal and abnormal ranges interns of the blood sample values is illustrated in the table and same thing is represented in the graphical way also. All the results related table2 to 6, graph1 to 5 and all illustrated in the last column of this paper

4. CONCLUSION

Retinal pictures play very important role in many applications like sickness diagnosing and human recognition. The segmental blood vessels are used for diagnosing of diseases like diabetic, eye disease and blind spot. In our planned methodology the retinal image as the input to mean, median and also the improved median and new filter is applied for pre-processing The segmented result shows that the modified filter rule will had best with relationship between the results of noise reduction and time quality of algorithmic program, the kirsch edge

Table 6
Blood Sugar level Vs all feature abnormalities of retinal image.

S. No.	Blood Sugar Value (x)	Width of the Blood Vessels (μm)	Number of Dots
1	60	2.02	7
2	70	3.03	8
3	80	4.04	9
4	90	4.23	10
5	110	4.8	12
6	130	5.3	14
7	150	5.7	16
8	180	5.9	19
9	220	6.3	23
10	250	6.6	24



Graph 5: Blood Sugar Value Vs all feature abnormalities of retinal image.

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New Analysis for Identification of Eye Diseases

B.Srilatha[1] and V. Malleswara Rao[2]

Abstract

In the present day, many different parcel of ailments that can influence ordinary human life. One such illness is called diabetic. This will impact in two cases one is eating routine and the second one is heredities. Because of this diabetic malady, 80% of individuals it will begin impact from the eye and afterward remaining body organs like kidney, liver heart, nerves and so forth. So this proposition needs to separate the element of eye. From this element, it will give the anomaly of the proportion in seriousness level insightful. Because of this approach, it will save the vision in early stage furthermore it will give the alarm to the rest of the body organs. This proposition will begin gathering the constant pictures from the diagnostic centre. These pictures were taken from the fundus camera. These pictures are full of noise, raw and unprocessed pictures. So that, next stride needs to remove the noise from the pictures. In this venture, all different types of filters are used to remove noise and performance of all the filters are verified using different parameters like SNR (Signal to Noise Ratio), MSE (Mean Square Error), SSIM (Similarity Index), RMSE (Root Mean Square Error), PSNR (Peak Signal to Noise Ratio). And after that next is feature extraction. They are veins, microaneysams, exudates, and optic disk for every element it is utilized best picture preparing calculations and at last gives gentle, direct, seriousness of the diabetic and this outcome is contrasted and glucose level estimation of similar patients. It was co-equal in both contextual investigations. On this task subsequently changed into completed, such a lot of evaluation like each functions regular and peculiar snap shots with their corresponding blood pattern and evaluation equations table and subsequently it turned into plot the graph blood sugar values Vs all of the functions normal and abnormal values.At last this will give straightforwardly eye ailment from the glucose values. So this proposed evaluation of software program will supply greater advantage for opthamologists to discover eye sickness from blood sugar ranges.

Keywords: Blood Sample Values, Corresponding Treatment, Eye Diseases Detection, Feature Extraction, New Filter

1. Introduction

Illness in membrane resulted from special diseases are determined by special pictures from membrane, that are obtained by exploitation optic imaging known as anatomical structure. The inexperienced channel is high reactive to the blood vessels. The improved median filter is employed to get rid of salt and pepper sound from the wicked image. The Global Health Organization (GHO) has calculated the amount of persons with eye diseases within the world would increase enormously from one hundred thirty five million in 1995 to three hundred million in 2025 (Ardizzone, et al., 2008). So as to scale back the unhealthy. Sound effects related to the process input Image was pre-processed by a filter, then, the retinal anatomical structure image is assessed in to a few primary

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parts like Red Channel (R), inexperienced Channel (G) and Blue Channel (B) (Vijayakumari et al., 2012). And modified filter is introduced to get still better performance of noise. Therefore the output is that the raised image a footing is associate degree sudden amendment within the brightness (gray scale level) of the pixels.

The removal of blood vessels in membrane pictures is very important step in designation and medical aid of diabetic retina. For unhealthy persons the diameter of the blood vessels might disagree or otherwise there is a break for growth of latest vessels once connected with traditional person's blood vessels. (Daniel Welfer et al., 2010) The blood vessels get enveloped for diabetic patients and it gets narrower for eye disease unhealthy patients. Exudates are one in every of the first signs of membrane unwellness, Automatic transude detection would be useful for diabetic retinopathy screening method. Along color and sharp edge options to find the exudates. The yellow objects are detected first. The objects within the image with terribly sharp edges are then found exploitation Kirsch's mask and alternative rotations of it on the inexperienced element. The mix of outcome of yellow objects with terribly sharp fringe is employed to work out the exudates. The Fuzzy C-Means (FCM) gathering could be a well-known cluster technique for image partition, several techniques are performed for exudates observation, and however they need to defect. And then improved FCM is used for better extraction. Poor quality pictures have an effect on the separation results of bright and dark injury exploitation thresholding and exudates feature extraction. Microaneursyms are the primary clinical abnormality to be noticed within the eye for diabetic retinopathy they are red lesions. Red lesions are the primary clinically evident injury indicating diabetic retinopathy. Therefore, their detection is critical for a pre-screening-system (Akara Sopharak et al., 2008). The purpose is that the shining 0.5 inside the standard image that will be seen as light, sphericalor vertically memory device is that the rein where blood vessels and cranial nerve fibre enter to the membrane of human eyes. It is the shining a region of the standard complex body part photos. Observation of the point (OD) is taken under consideration united of the vital part of study of digital color retinal pictures [19]. In our planned System watershed rule is employed for the optic discs detection and hence the severity of the attention diseases is examined. Supported the output results of those four extractions we discover the severity of the unwellness as gentle, moderate or severely affected. And at last will do the treatment in early stage and that we can save our vision.

2. Materials and Methods

All the 110 pictures are utilized in this paper are acquired from the government hospital real time patients. There are Associate in retinal color complex body part pictures with an vary size of four hundred × 600 x three pixels, together with the cranial nerve contours derived by 2 specialists.

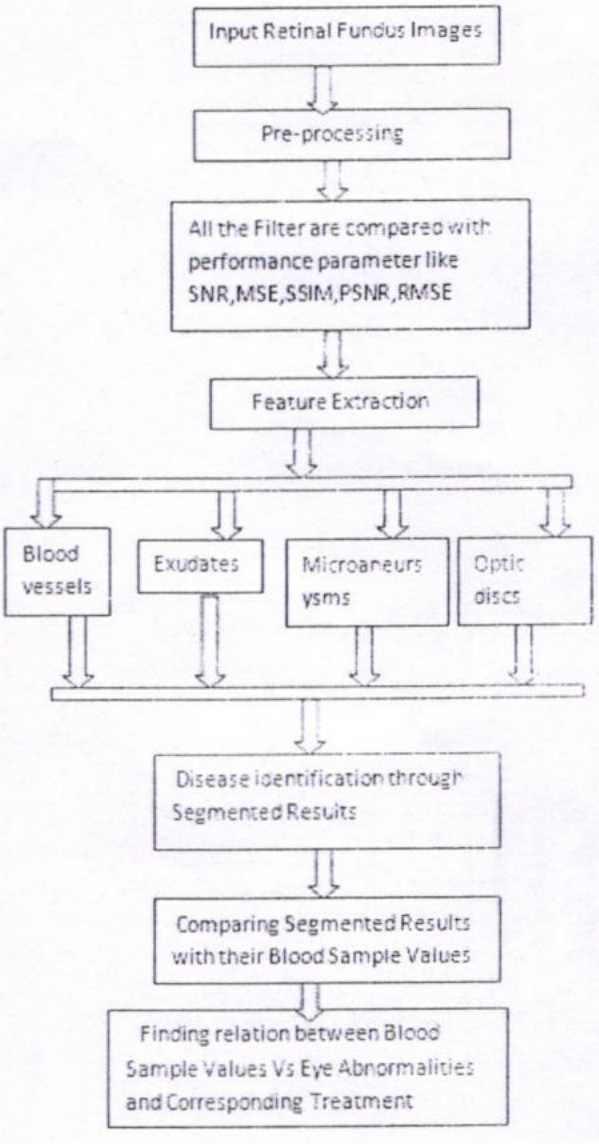
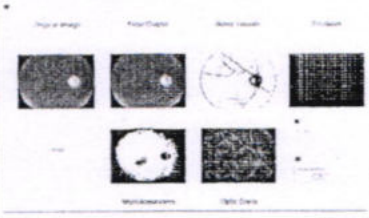
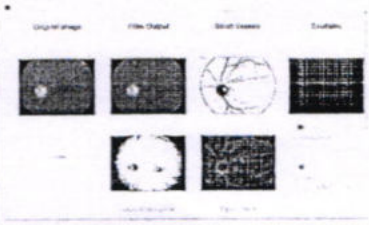
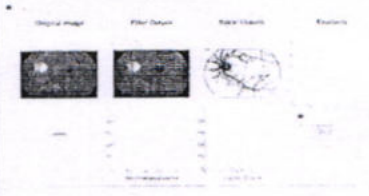
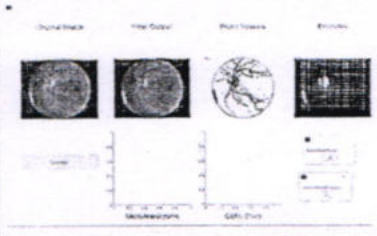
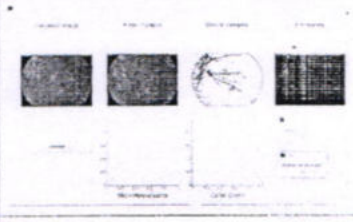
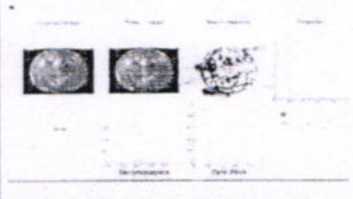
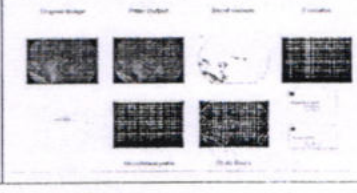
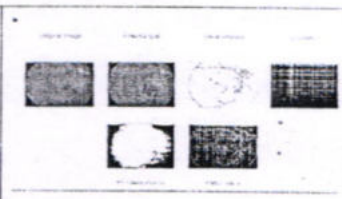
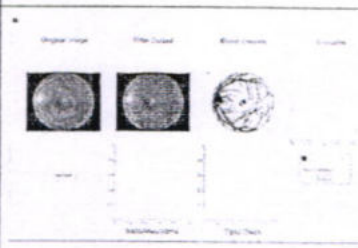


Figure 1. Planned System for Eye Diseases Detection.

Table1. Segmented Results Compared with Blood Sample Values

SL.No	Patient Name	Age (Years)	Blood Sugar Values(Mg/dl)	Results	Disease
1	Lakshmi.P	45	80		Normal
2	Latha.S	48	90		Normal
3	Aruna kumara.S	34	100		Blood Eessels Effected
4	B.Babu	20	140		Exudates Effected
5	T.Esupadam	60	130		Exudates Effected
6	A.Ishwarya	25	110		Blood Vessels Effected
7	B.Nageswara Rao	70	70		Normal

8	P.Pushpavathi	67	180		Exudates and Microanesyms effected
9	B.Parvathi	64	100		Blood Vessels Effected

2.1 Planned System

The planned system consists of 4 stages. Initial stage is collection the pictures of patients by fundus camera. This can be raw pictures and contains choked with noise. This noise is detected by filters. Modified filter is employed from the mean, median and improved median filter and modified filter for the removal of error caused whereas taking of the image and to scale back the noise and next stage is the extraction of options of eye like veins, Exudates, Microaneursyms and optic discs by image process algorithms. They are brandy edge detection rule, modified fuzzy cluster rule, morphological distance based rule and watershed rule and at last fourth stage is comparison between blood sample results and segmented results. The planned system for detection of eye diseases is illustrated in **Fig. 1**.

2.2 I-Stage

Collecting real time patient's images from the hospitals. These images are taken by fundus camera. This will be full of noise and raw images. That noise can be reduced in the second stage using filters

2.3 II-Stage: Preprocessing

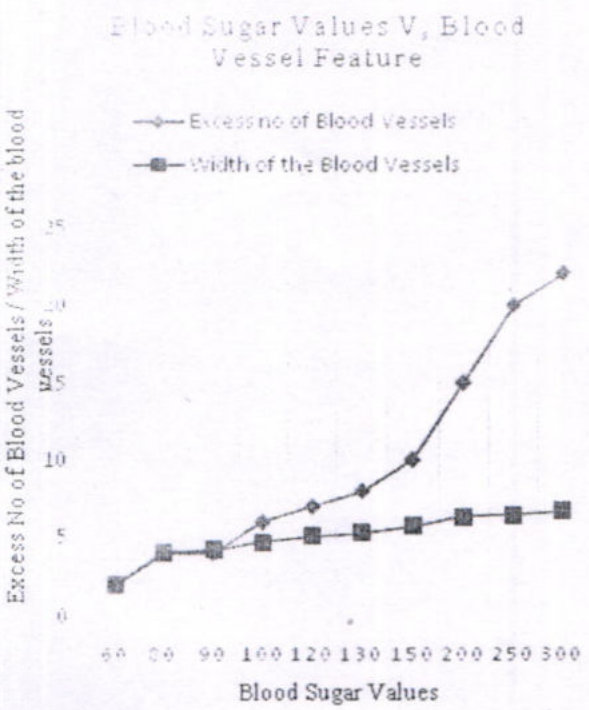
The pre-processing step removes difference due to image gain, such as inhomogen. The illumination Techniques such as morphological operations are trying to the input image. The following session's complex the modified filter developed from the mean, median, improved median and modified filters that can be used in pre-processing stage in this paper.

3. Modified Filter

To remove salt and pepper noise from the corrupted image with additional algorithms is employed. The output of all the filters square measure compared with modified filter for the given input retinal pictures and additionally compared the performance of image with SNR (Signal to Noise Ratio), MSE (Mean Square Error), SSIM (Similarity Index), RMSE (Root Mean Square Error), PSNR (Peak Signal to Noise Ratio). Quantitative relation conjointly finally modified filter gave best results compared to different filters. Modified filter is a combination of three filters mean filter, median filter and improved median filter (Gaussian, Speckle, Salt and pepper noise) Each pixel"s value of the image is replaced by theaverage value of similar patches all over the image.

The algorithmic program is given below.

- A color image is taken for experiment purpose.
- The color image is converted into gray image.
- Mixed noise image is obtained by adding three different noises (Gaussian, speckle, salt and pepper noises) at zero mean and different variances.
- Mixed noise is filtered first by mean filter.
- Mean filtered image is filtered by median filter.
- Median filtered image is filtered by improved median filter.
- Each pixels value of improved median filtered image is replaced by the common the average value patches everywhere the image.
- Denoised image may be a gray image therefore its regenerate into color RGB image. This is often the ultimate Denoised image.



Graph 1 Blood Sugar Value Vs Width of the Blood Vessels.

Table 2. Blood Sugar Level Vs Excess no of Blood Vessels and Width of the Blood Vessels.

S No.	Blood Sugar Level (mg/dl)	Excess no of the Blood Vessel	Width of the blood vessels (µm)
1	60	2	2.02
2	80	4	4.04
3	90	4	4.23
4	100	6	4.7
5	120	7	5.1
6	130	8	5.3
7	150	10	5.76
8	200	15	6.32
9	250	20	6.4
10	300	22	6.7

3.1 III-Stage-Feature Extraction Blood Vessels Extraction:

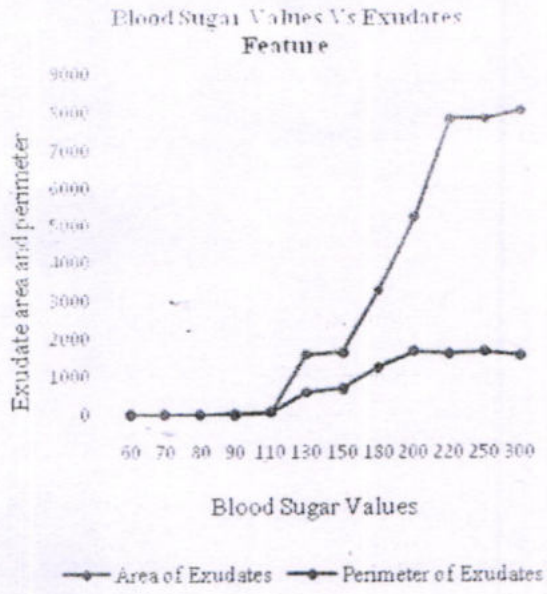
The observation of blood vessels from the retinal pictures may be a tedious method. In our planned algorithmic rule, Kirsch's model is employed for detection the blood vessels from the retinal pictures. For kirsch edge detection, the edge image (i.e., detected edges) is considered the area gradient. The kirsch gradient operator is chosen to extract the contour of the article. The kirsch edge detection uses eight masks (i.e., eight masks for connected eight main directions) that are applied to given image to find edges. Except the outmost row and also the outmost column, each component and its eight neighbourhoods in an exceedingly given image are convolved with these eight templates. Each component has eight outputs. And also the utmost output of the eight templates is chosen to be the value in given position. This can be outlined because of the edge magnitude. The direction of edge is outlined by the connected mask. The ultimate gradient is that the summation of the improved edges by considering all directions for RGB channel instead of any single channel. Here, numerous directional enhanced pictures are presented. This feature extraction is compared with all the algorithms. Finally our planned algorithmic rule given correct results.

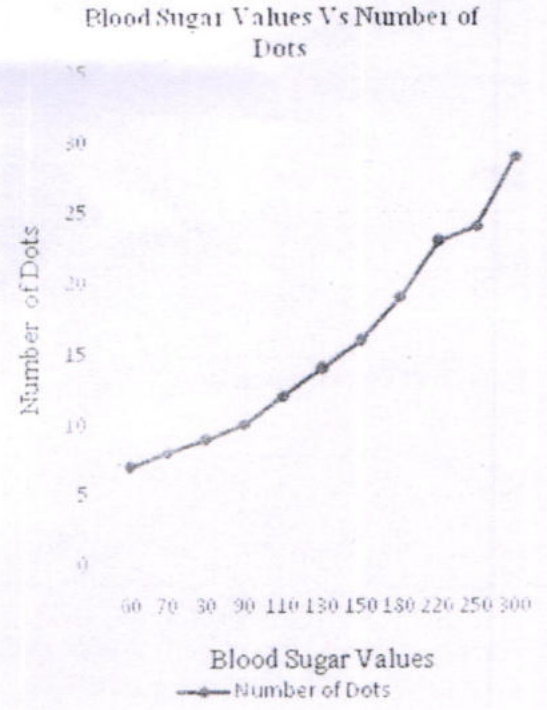
3.2 Exudates Extraction:

Exudates are tiny yellow white patches with sharp margins and totally different shapes. Exudates are one among the first occurring lesions. Exudates are accumulations of lipoid and macromolecule within the membrane. Generally they are bright, reflective, white or cream coloured lesions.

Fuzzy cluster is Associate in nursing overlapping cluster formula, where each purpose might belong to loads of or two clusters with completely different degrees of membership. The choices with shut similarity in an exceedingly image unit of measurement classified into constant cluster. The similarity is made public by the gap of the choices vector to the cluster middle. Geometrician distance is used to measure this distance Associate in nursing data are attending to be associated to associate degree applicable membership value. The cluster middle is updated until the excellence between adjacent objective perform, is close to zero or abundant however a predefined very small and constant. To stop that our algorithm gets trapped in minima, the MFCM formula is initialized with the higher than fast FCM algorithmic rule. Once the fast FCM is stopped, the MFCM formula stick to it with the values for the prototypes and membership values obtained from the short FCM formula. The MFCM formula then iteratively updates it's a priority probability, membership and centroids with these values. Once the MFCM formula has

converged, another defuzzification technique takes place so as to convert the fuzzy segregation matrix to a crisp segregation matrix.





Graph 2. Blood Sugar Value Vs Area of the Exudates and Perimeter of Exudates.

Thus the MFCM algorithmic rule is given as follows:

Step 1: Set the cluster centroids vi in line with the bar graph of the image,
Step 2: Calculate the bar graph exploitation
Step 3: Calculate the membership operate exploitation
Step 4: Calculate the cluster centroids
Step 5: Hold to step three and repeat till convergence.
Step 6: Compute the a priori probability with the obtained results of membership function and centroids.
Step 7: Recomputed the membership function and cluster centroids and the probabilities.
Step 8: If the algorithm is convergent, go to step 9; otherwise, go to step 6.
Step 9: Image distribution after defuzzification and then a region labeling procedure is performed.

This feature extraction is compared with all the algorithms. Finally our proposed algorithm gave correct results.

Table 3. Blood Sugar Level Vs Area of the Exudates vessels and Perimeter of Exudates.

S No.	Blood Sugar Value (x)	Area of Exudates (y)	Perimeter of Excudates
1	60	0	0
2	80	0	0
3	90	0	0
4	100	4	04.8484
5	120	79	63.0122
6	130	1567	574.6589
7	150	1640	683.5706
8	200	3286	1238.2
9	250	5243	1668.5
10	300	7836	1597

Table 4. Blood Sugar Level Vs No of Dots.

Sl No.	Blood Sugar Value (x)	Number of Dots (y)	Severity
1	60	7	Normal
2	80	8	Normal

3	90	9	Normal
4	100	10	Normal
5	120	12	Mild
6	130	14	Mild
7	150	16	Medium
8	200	19	Medium
9	250	23	Severe
10	300	24	Severe

4. Microanerusyms Extraction

Microaneurysms on the retina appear as small red dots of maximum size to be less than the diameter of the major optic veins. The recognition of microaneurysms is essential in the operation of diabetic retinopathy grading, since it forms the basis of deciding whether an picture of a patient's eye should be considered healthy or not.

5. Morphological Distance Based Algorithm

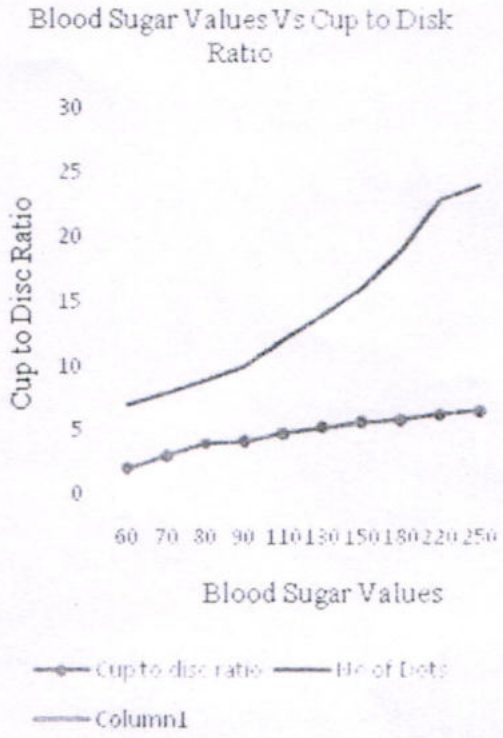
Microaneurysms are small saccular pocket caused by local distension of capillary walls and appear as small red dots. Their walls are thin and rupture easily to cause hemorrhages. To detect visible micro aneurysms in retina using size and shape automated micro aneurysms detection and diabetic retinopathy grading and Hough transforms are present but the morphological distance based algorithm for Microaneurysms is effective and the steps involved as shown below.

Step 1: The pre-processing step filters the image, increases the contrast and performs a shading correction in order to balance the non-uniform illumination across the picture. The diameter-closing step is a mathematical morphological transformation that fills in all the black dots with diameters smaller than λ.

Step 2: After performing such closing transformation, the grey-scale value of the filled-in dots is higher than in the increased pre-processed image, while the vessels and other elements remain virtually unaffected. The black top-hat step uses size and shape criteria to isolate the black components contrasted against the background.

Step 3: The black top- hat transform is the result of the difference between the images obtained by the size closing and pre processing steps. The automated threshold step identifies all elements in the black top-hat picture that are possible μA candidates.

Step 4: Finally a K-nearest neighbours (k -NN) classifier is used for classification. It uses the Properties calculated for the candidates to find them as either true μA or false positives based on the learning set in the small database. The classifier acts like a human grader by taking into account factors such as size, contrast, circularity, grey-scale level and colour.Then the true microaneurysms are detected.



Graph 3. Blood Sugar Value Vs Number of Dots.

6. Optic Disc Extraction

Optic disc is the brightest part of the retina and it is in oval in shape and for diabetic retinopathy affected person the oval structure is irregular in structure.

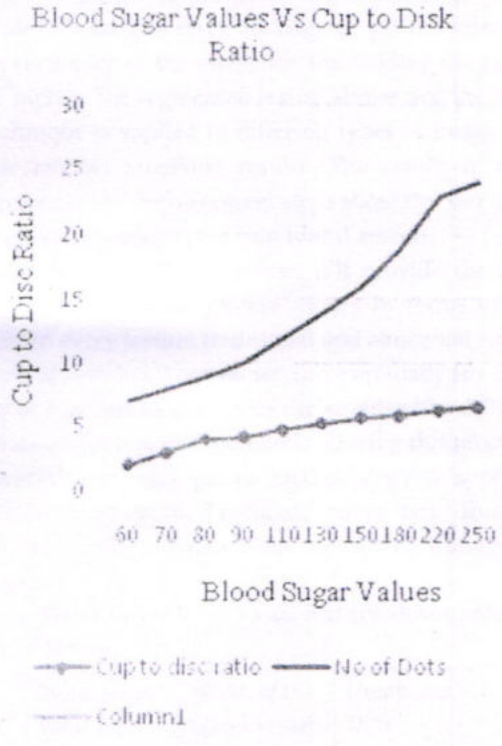
6.1 Watershed Transformation

An implementation of the watershed transform was presented by Vincent & Soille. Since we want to discuss this

implementation in some detail, we reproduce their algorithm here in pseudocode. In this algorithm there are two steps:

Step 1: Sorting the pixels w.r.t. increasing grey value, for direct access to pixels at a certain grey level;

Step 2: A flooding step, continuing level by level and starting from the minima. The implementation uses a inventory accounting queue of pixels, that is, a _rst-in-_rst-out system on that the subsequent operations is performed: cfo add (p; queue) adds component p at the end of the queue, cfo remove(queue) returns and removes the erst component of the queue, cfo init(queue) initializes AN empty queue, and cfo empty(queue) may be a check that returns true if the queue is empty and false otherwise.



Graph 4. Blood Sugar Value Vs Cup to disk ratio.

Table 5. Blood Sugar Level Vs Cup to Disk Ratio.

Sl No.	Blood Sugar Value (x)	Cup to Disc Ratio (y)	Severity
1	60	0.6	Normal
2	80	0.5	Normal
3	90	0.65	Normal
4	100	0.7	Mild
5	120	0.75	Mild
6	130	0.8	Medium
7	150	0.85	Medium
8	200	0.87	Medium
9	250	0.9	Severe
10	300	0.95	Severe

IV. Segmentation and Result

We enforced our planned technique exploitation Mat lab and applied more than 50 images of normal and abnormal patients .The modified filter is enforced for denoising of extremely corrupted pictures and edge prevention. The kirsch edge detection rule works well for the pictures having clear distinguish between the foreground and background, since the retinal blood container is thought of as needed foreground data for fundus pictures kirsch rule is effectively register. Exudates are one in every of the foremost factor of diabetic retinopathy and responsible for liable for hazy views and visual defect fuzzy cluster algorithms is employed for the extraction of exudates once this microaneursyms are first clinical abnormality to be noticed in eye. The red lesion is detected by the morphological distance based mostly algorithms. The bright portion of the anatomical structure image is optic discs that could be a pale, spherical or vertically slightly oval form disk circular region fromwherever the blood vessels emanate is known as the blind spot.

Based on the top of the results, here we tend to got the formula. That may offer the relation between blood glucose level Vs retinal diagnosing options

ie. Only 1 Feature = 90 to 130 mg/dl

2 Features= higher than 130 to 180 mg/dl

Any 3 Feature =above a hundred and eighty to two hundred mg/dl

All four features = on top of two hundred mg/dl

During this step compared the patient retinal image segmental results with the patient blood glucose values exploitation blood glucose machine. This can provides the severity of the sickness and additionally performance of the segmental results. This comparison is illustrated

sels detected is having more width than the original blood vessels so enhancement is required in this operator. This work indicates that support vector machines can be effectively used for image classification. Even though by now some progress has been achieved , there are still remaining challenges and directions for further research, such as , extracting different features and developing better classification algorithms and integration of classifiers to give better performance and reduce the classification errors.

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Life- Your Heart Speaks Your Password

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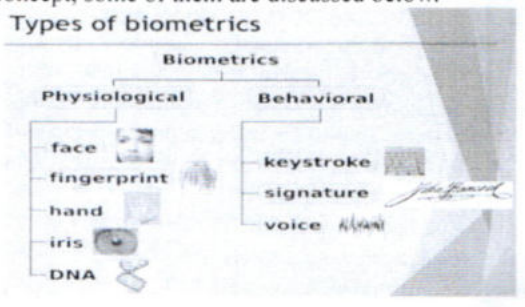
Abstract:- **The security is an important aspect of our daily life whichever the system we consider security plays a vital role. The biometric person identification technique based on the pattern of the human Iris, face, fingerprint or heartbeat is well suited to be applied to access control and provides /Strong security. In this paper, we focus on an efficient methodology of fingerprint, heartbeat, iris and face for identification and verification with total success rate. In this method, the image of the fragment taken is normalized and converted into binaries. The anatomy image and the series of operations such as segmentation, normalization, feature encoding are performed and it is converted into binaries. These bits are compressed and crossed over into a combined biometric key. This combined biometric key is used to bind each bit of the cryptographic key. This bound version of the key is used for enrolment and to release the key. Instead of storing the actual key, its hashed version is stored in order to conceal the cryptographic key to provide a secure comparison method for key verification. This bound version of the key is released only if this matches with the one identically. During enrolment, these features are used to bind a cryptographic key. The operation involved is the binary XOR. Here, the goal of the system is to reject, an unauthorized subject who does not possess the original features, for example, used during enrolment. In contrast, a genuine subject with the correct features will be accepted. By this spoofing can be avoided, since two kinds of keys are needed to encrypt the data and these keys are generated at once. This reduces the false acceptance rate and false rejection rate thereby the total success rate seems to be high since the key preserves security level to high.**

Keywords--- **Biometric key, Cryptographic key, Helper data, Hashed key.**

I. INTRODUCTION

The word biometric is derived from the Greek words bio and metric. Where bio means life and metric means to measure.Biometric authentication is the primary and prevalent system for security and surveillance activities in the past several years. The automation in every field of daily life has made human identification and verification is a prime issue for ensuring the security. The biometric techniques are relates to the parts of human body which are unique, cannot be stolen and is not easily transferable compared to traditional methods such as Identification badges, Personal Identification Number (PIN), password, smartcards etc., The commonly used biometric features include speech, fingerprint, and face, Iris, voice, hand geometry, retinal identification. A biometric sensor is a transducer that changes a biometric treat of a person into an electrical signal. Biometric treats mainly include biometric fingerprint reader, iris, face, voice, etc. Generally the sensor reads or measures light, temperature, speed, electrical capacity and other types of energies. Different technologies can be applied to get this conversation using sophisticated combinations, networks of sensors and digital cameras. Every biometric device requires one type of sensor. The biometrics applications mainly include: used in a high definition camera for facial recognition or in a microphone for voice capture. Some biometrics is specially designed to scan the vein patterns under your skin. Biometric sensors are an essential feature of identity technology. Biometric sensors or access control systems are classified into two types such as Physiological Biometrics and Behavioral Biometrics. The physiological biometrics mainly include face recognition, fingerprint, hand geometry, Iris recognition and DNA. Whereas behavioral biometrics include keystroke, signature and voice recognition. For better understanding of this concept, some of them are discussed below.



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II. PROPOSED ALGORITHM

a. Biometric key generation
Step 1: Images acquisition.
Step 2: Enhancement of the images.
Step 3: Feature extraction.
Step 4: Biometric key is generated.
b. Combined key generation
c. Generation of helper data and hash key
Step 1: Performing Hashing function on the cryptographic key and Store the hashed key in the database.
Step 2: Helper data is generated as a result of binding the cryptographic key with the combined biometric key.

III. DIFFERENT TYPES OF BIOMETRICS

a. Fingerprint scanner
A fingerprint scanner system has two basic jobs -- it needs to get an image of your finger, and it needs to determine whether the pattern of ridges and valleys in this image matches the pattern of ridges and valleys in pre-scanned images.
Only specific characteristics, which are unique to every fingerprint, are filtered and saved as an encrypted biometric key or mathematical representation. No image of a fingerprint is ever saved, only a series of numbers (a binary code), which is used for verification. The algorithm cannot be reconverted to an image, so no one can duplicate your fingerprints.

b. Iris scanner
First the system has to localize the inner and outer boundaries of the iris (pupil and limbs) in an image of an eye. Further subroutines detect and exclude eyelids, eyelashes, and secular reflections that often occlude parts of the iris. The set of pixels containing only the iris, normalized by a rubber sheet model to compensate for pupil dilation or constriction, is then analysed to extract a bit pattern encoding the information needed to compare two iris images .In the case of Daugman's algorithms, a Gabor Wavelength transform is used. The result is a set of complex numbers that carry local amplitude and phase information about the iris pattern. In Daugman's algorithms, most amplitude information is discarded, and the 2048 bits representing an iris pattern consist of phase information (complex sign bits of the Gabor wavelet projections). Discarding the amplitude information ensures that the template remains largely unaffected by changes in illumination or camera gain, and contributes to the long-term usability of the biometric template.
For identification (one-to-many template matching) or verification (one-to-one template matching) a template created by imaging an iris is compared to stored template(s) in a database. If the Hamming distance is below the decision threshold, a positive identification has effectively been made because of the statistical extreme improbability that two different persons could agree by chance ("collide") in so many bits, given the high entropy of iris templates.

c. Face recogniser
All of these systems take in data – often an image – from an unknown person, analyse the data in that input, and attempt to match them to existing entries in a database of known people's faces or voices. Facial recognition does this in three steps: detection, face print creation, and verification or identification. When an image is captured, computer software analyses it to identify where the faces are in, say, a crowd of people. In a mall, for example, security cameras will feed into a computer with facial recognition software to identify faces in the video feed.

d. Voice recogniser
To convert speech to on screen text or a computer command, a computer has to go through several complex steps. When you speak you create vibrations in air, the analog to digital converter (ADC) translates this analog wave into digital data that computer can understand. To do this, it samples, it digitalises, the sound wave taking the precise measurements of the wave of frequent intervals. The system filters digitalise the sound to remove unwanted noise and sometimes separate it into different bands of frequency. It normalises the sound or adjusts it to the constant volume level. It may also have to be temporarily aligned. People don't always speak at the same speed, so the sound must be adjust to match the speed of the template, sound sample already stored in the system memory.
Next the signal divided into small segments as short as a few hundredth of a second, or even a thousand in case of plosive consonant sounds. Consonant stops produced by obstructing air flow in vocal tract like 'p' or 't'. The program then matches the segments to known phonemes in the appropriate language. A phonem is a smallest element of the language a representation of the sounds we make and put together for a meaningful statements.

e. Heartbeat sensor
The heartbeat sensor is based on the principle of photo plethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region). In case of applications where heart pulse rate is to be monitored, the timing of the pulses is more important. The

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flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses.

There are two types of photo plethysmography: Transmission: Light emitted from the light emitting device is transmitted through any vascular region of the body like earlobe and received by the detector. Reflection: Light emitted from the light emitting device is reflected by the regions.

IV. THE FUTURE- HEARTBEAT PASSWORD SECURITY

A device measures your heartbeat and uses it as a unique biometric to identify you. It measures your heartbeats, it confirms that you – the rightful owner are wearing it, and then it's able to communicate that identity to whatever system or service you use. So, what we're hoping is that it means the end of things like passwords and pin numbers. But it could even replace things like car keys, house keys, credit cards, and boarding passes. These are all different proxies for identity. We think that a wearable device that's paired with your biometric can be a much easier, more secure form of user identification.

PROCESS:

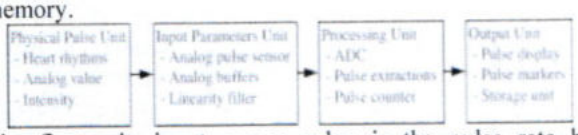
1. Physical pulse
2. Input parameters
3. Central processing units
4. Output parameters
5. Storage units

First step: Physical pulse is defined pulse that represents the heartbeat rhythm is defined as the number of beats per minute.

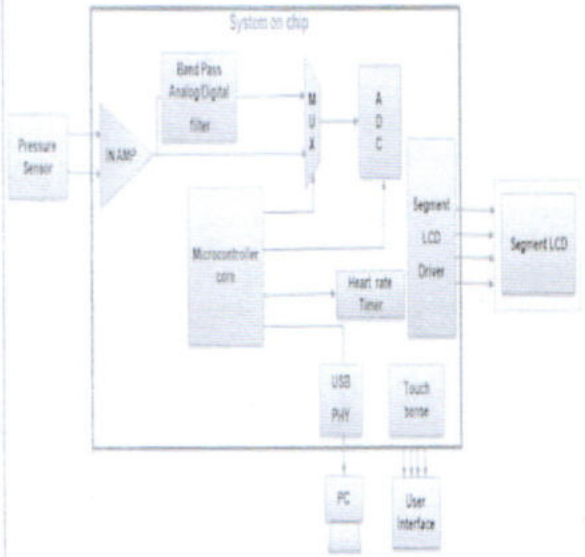
Second step; Input derived parameters are parameters which are then used to make physical linearity filter by buffer circuit to forward it to the central processing unit.

Third step; Central processing unit serves as calculation algorithm to analyze the results transmitted to the output.

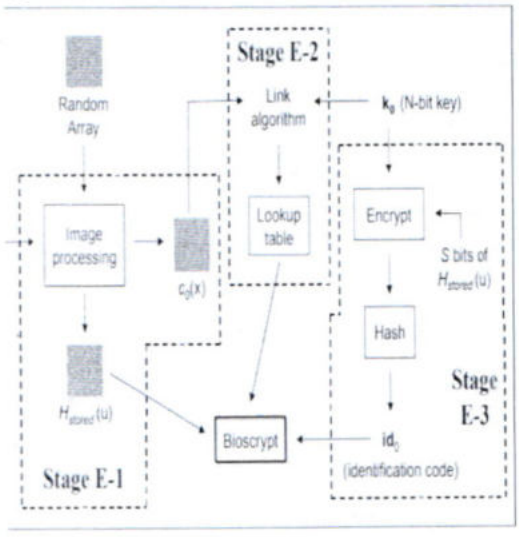
Fourth step; Output parameters such as the amount of pulse rate, dynamic number of pulse signal, and stored into memory.



The first unit, input sensor value is the pulse rate by detecting the intensity of the light and into the calculation and processing. The second unit calculation and processing serve as a hub to receive and send information, including the calculation of the software. The third unit, display unit is used to represent data obtained from measurement through LCD display. The fourth unit, analysis is analyzing or classification of information to group the symptoms of subjects. The fifth unit, storage unit stores the information into the SD card to store data records of subjects



Algorithm implementation: the system implementation in term of software control consists of functions such as pin Mode, LCD begin, analog Value, and interrupt Setup, etc. This preliminary study composes optical sensor input and then process unit for calculation and monitor to display unit. The algorithm shown in below:



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```
# Algorithm design and implementation
//Include preprocessor
//Variables of Pulse sensor
//The interrupt service routine
    data type ;          //initialization the variable
// Programming procedure
void setup() {

  File dataFile = SD.open("neramitr.csv", FILE_WRITE);
                              // open head file of SD card
  {
   pinMode(data_type, INPUT);    //define PIN status
   pinMode(data_type, OUTPUT);   //define PIN status
   Serial.begin(bit rate);       //define data bit rate
   lcd.begin(x,y);               //define display unit
                              //Subject_ID, SEX, AGE calibration
       analogValue = analogRead(data type);
   clear();                                  // clear temporary
   interruptSetup();             // sets up to read Pulse Sensor
   }
   dataFile.close();             // close file of SD card
}

void loop() {
  analogValue = analogRead(data type);
                                  //ID,SEX,AGE set calibration
  reading=digitalRead(IN_PIN);    //read from Digital PIN
  sendDataToProcessing('S', Signal);
                              //send Processing the raw Pulse Sensor data
  }
```

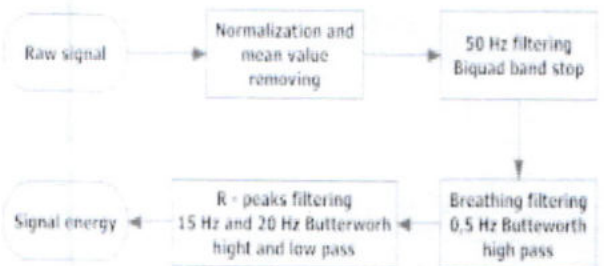
DETAILED CONVERSION OF HEARTBEAT SIGNALS INTO DIGITAL SIGNALS

A transducer comprising a pair of flexible walls, one of which senses mechanical pulsations and transfers the pulsations to a volume of gas, and the other of which receives the pulsations from the gas and produces an electrical signal there from. The invention provides a sensitive device that produces an electrical signal in response to heartbeat pulsations. In one embodiment, the invention employs a wrist- mounted case or housing in which slightly pressurized gas, preferably air, is confined in a chamber between a pair of flexible walls, one of which is a high compliance follower membrane that senses the heartbeat pulse signature and the other of which is a piezoelectric membrane. Heartbeat pulsations applied to the follower membrane are transferred to the piezoelectric membrane through pressure oscillations in the air, serving as a coupling medium. In another embodiment, two chambers containing gas, preferably air, are wrist-mounted at separate locations. A first chamber has a wall constituted by a piezoelectric membrane and is contained in a case positioned on a wrist, like a watch. A second chamber has a wall constituted by a compliant follower membrane exposed to heartbeat pulsations, and is mounted on a band attached to the case, like a watch band. The two chambers are connected by tubing that transfers heartbeat pulsations from the second chamber to the first chamber via air in the tubing, serving as a coupling medium. Both embodiments preferably employ electronics including, for example, an amplifier with a high input impedance stage to convert the current output of the piezoelectric membrane to a voltage, and a voltage amplifier stage to produce an output signal that can be displayed locally or at a distance. This digital signal taken is recorded using a storage device as an image using an encryption code. This encryption code is referred using a similar cipher code that creates image for each signature entry found and compares with the previously stored image in the database.

Signal acquisition

ECG signal for digital signal processing and heart rate calculation was acquired by measurement card with sampling frequency fs = 500 Hz. The first ECG lead was measured. Analogue signal pre-processing was done on simple amplifier circuit designated for ECG signal measurement. The circuit with ECG amplifier is fully described in raw ECG signal sampled by measuring card. This signal was used as input signal for the digital filters and the heart rate detection algorithms designing and testing.

Digital signal processing with digital filters in this part there is described noise elements filtering and baseline wander elimination with digital filters. The main noise elements are power supply network 50 Hz frequency and breathing muscle movements. These artifacts have to be removed before the signal is used for next data processing like heart rate frequency determination. The block schema of digital signal processing with digital filters:



At the beginning, the mean value is removed from signal. Then signal is normalized for unit maximum amplitude. Network interference at 50 Hz frequency is removed by first filter. This filter type is bi-quad band stop. Advantage of this filter is very narrow band stop which is created by poles and zeros location. Baseline wander was provided by means of the next filter. This filter is second order Butterworth filter set to frequency of 0.5 Hz. This filter is usually used in professional ECG filtering applications .The signal filtered by these filters.

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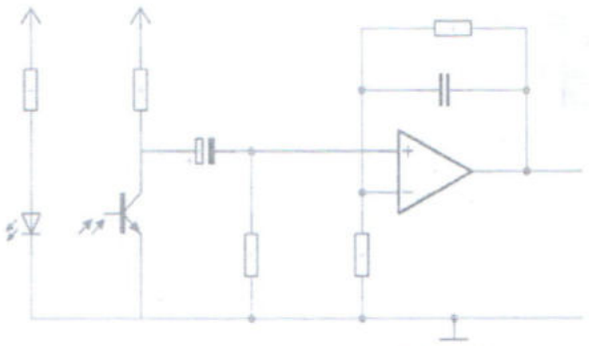
After the basic filtering, the R-peaks are detected from ECG signal. R-peaks filtering are necessary for next heart rate detection. The signal is filtered by high pass and low pass Butterworth filters with cut-off frequencies 15 Hz and 20 Hz. Both filters are fourth order because of computing difficulty in next implementation in a microprocessor. Using of these two filters has better results than one band pass filters. The signal energy of samples from voltage amplitude is calculated then by

$$E(t) = u(t)^2$$

Matching algorithms are used to compare previously stored templates of fingerprints against candidate fingerprints for authentication purposes. In order to do this either the original image must be directly compared with the candidate image or certain features must be compared.
The stored digital form of the heart beat signature is encrypted using a cipher code and stored in encrypted form.

COMPARISION OF HEARTBEAT SIGNATURES

Minutiae image is divided into segments, each segment is corresponding minutiae's group is described by parameters (x, y, nom), where x and y are the coordinates, and nom determines the number of minutiae in the group. Additionally, one implementation uses an additional parameter specifying the probabilities of damage in a given segment, which is estimated by a neural network, based on the distribution of areas rejected by the mask described by the formula. Current algorithm implementation searches small groups of minutiae that that contain up to 5 minutiae. Then, based on the neighboring groups (max 4) creates a new large group. For each, the orientation parameters and the number of characteristic points are recalculated. The last step is to create a matrix of Euclidean distances between the largest groups. When comparing the use of two parameters: dx - the distance defining the difference between groups in the pattern and tested heartbeat signature, px - the threshold of damage occurrence probability (determined by whether the group is under consideration in the analysis), we decide which groups should be compared and we set the priority for them. After that we do the comparison of the groups, which are divided according to the priority, that is defined by the number of minutiae in the group and selective attention (SA) algorithms, which are based on probabilities of damage. Heart beat signature divided into segments. The identical match between both the signatures fetches out the signal that indicates that input signature is authorized.



ADVANTAGES

- Cannot be forgotten or lost
- Reduced operational cost
- Improved security and customer experience
- User friendly
- Nearly impossible to forge
- Offers mobility
- Ensures the highest accuracy
- Biometric credentials are always with you
- Several applications can be enhanced like pc unlocking, smart appliance access, smart car access, authorising almost anything which requires an authorisation etc.
- Health issues can be lively monitored.

DISADVANTAGES

- Additionally requires a hardware to configure
- Once compromised cannot be reset
- Comparatively high cost
- An clone of the signature can be easily replicated
- The database has to be explicitly secured

V. CONCLUSION AND FORESEEK

This research is to construct the heartbeat signal measurement security, which used embedded system and pulse sensor techniques as shown in system architecture. This preliminary study will be composed the system design, analysis, testing, implementation, and performance evaluation. The research illustrates the efficiency, accuracy, quantity of subjects, and good results. This may even become practical facilitating biometric authentication, and it will be the most secure than any other biometric security made till today.

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IoT: Trends, Challenges, & Future scope

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Abstract:- **IoT (Internet of Things) one of the most exciting trends and innovation in the recent history of technological advancement. IoT can be defined as a network of physical objects, devices that contain embedded technology (like intelligent sensors, controllers etc.) which can communicate, sense, or interact with internal or external systems. Various IoT based applications have been explored and the possible approach for enhancing the use of this technology has been discussed in this paper. Future directions and suggestions for effectively and efficiently improving the IoT based application areas have been touched upon. This paper will provide a better insight for anyone who wishes to carry out research in the field of IoT. Here we have tried to provide a holistic perspective on IoT and IoT based applications, application areas, research challenges in IoT, trends and future possibilities in IoT.In this paper, we have studied the most imperative parts of the IoT with accentuation on what is being done and what are the issues that require further research. We believe that, the given interest shown by industries in the IoT applications, in the next years addressing such issues will be a powerful driving factor for networking and communication research in both industrial and academic laboratories.**

Keywords: **Intelligent sensors, Controllers, Innovation.**

I. INTRODUCTION

The Internet of Things (IoT) paradigm refers to the network of physical objects or "things" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with servers, centralized systems, and/or other connected devices based on a variety of communication infrastructures. IoT makes it possible to sense and control objects creating opportunities for more direct integration between the physical world and computer-based systems. When IoT is augmented with sensors and actuators.The IoT is comprised of smart machines interacting and communicating with other machines, objects, environments and infrastructures. Now a day's every persons are connected with each other using lots of communication way. Where most popular communication way is internet so in another word we can say internet which connect peoples. Now a day's everywhere like at railway station, shopping malls, in colleges an information desk is mandatory that provides information about the train schedule, promotional offers and important notice immediately. From educational organization perspective, the problem is that it requires some staff that is dedicated to that purpose and that must have up to date information about the institute and the recent happenings in the institute.

a) Enabling technologies for the IOT:-

There are three types of technologies that enable the internet of things,

i. Near-field communication and Radio Frequency Identification (RFID) - In the 2000s, RFID was the dominant technology. After few years, NFC became dominant (NFC). NFC has become common in smart phones during the early 2010s, with uses such as reading NFC tags or for access to public transportation.

ii. Quick response codes and Optical tags - This is used for low cost tagging. Phone cameras decode QR code using image-processing techniques. In reality QR advertisement campaigns gives less aurnout as users need to have another application to read QR codes.

iii. Bluetooth and low energy - This is one of the latest techniques. All newly releasing smart phones have BLE hardware in them. Tags based on BLE can signal their presence at a power budget that enables them to operate for up to one year on a lithium coin cell battery.

b) Operational technology (OT) is combination of hardware and software that detects or causes a change through the direct monitoring and/or control of physical devices, processes and events in the enterprise. It comprises the devices, sensors and software necessary to control and monitor plant and equipment etc.

c) Information Technology (IT), on the other hand, combines all necessary technologies for information

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processing. Information Technology is the application of computers to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise. IT is considered a subset of information and communications technology (ICT).In conventional approaches we have computers and Internet being dependent on human beings for information. Nearly majority of data available across the globe on Internet were first captured, generated by humans either by typing, or applying an external trigger event, or by other various modes of creating data. The issues associated with it are that people have limited time, are bound to commit errors while generating data i.e. capturing data will have accuracy issues. With the recent advances in technologies Internet is becoming more widely available, the cost sky-rocketing. This factors have made possibilities for IoT based applications reach new heights whereby creating wider scope for further advances. With this there has been a wide scope of increase in applications of IoT ranging from healthcare, telecom, oil field maintenance, transportation etc... There are basically few key focus areas that one has to consider while deciding upon IoT based applications:

d) Connect and Scale with Efficiency: Connect any asset, thing that's important and useful in your day to day applications and it can range from robotics applications to low-power devices, across diversified platforms or operating system. Easily scale from a few devices to a few million.

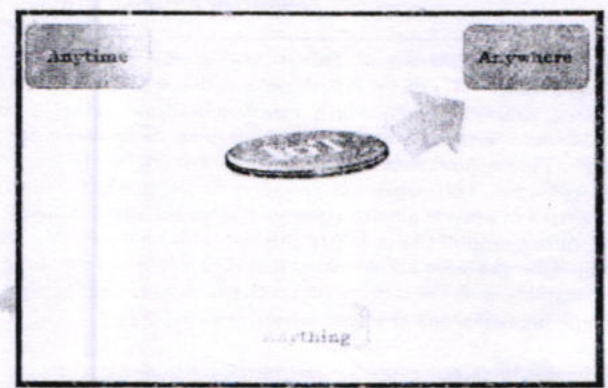
e) Analyze and act on untapped data: Data and alerts from all of your connected assets spread around the globe. Spot issues related to managing wide range of available data before they become operational problems. Utilize the available data for relevant application areas. Take advantage of advanced analytics and machine learning to increase reliability and uptime of your processes. Decrease costly outages and expensive repairs with prescriptive maintenance. And, take preemptive actions instead of understanding just the "what" and "why" behind a prediction.

f) Visualize what is important: Create rich dashboards and reports to show anything from high level of abstraction to low level of abstraction. Customize visualization so the right people have access to the metrics that matter to them, updated in real-time. Access data and reports from any device, anywhere; and publish reports to your organization.

Some standard definitions for IoT are mentioned here: "As defined by Atzori et. al., Internet of Things can be realized in three paradigms – internet-oriented (middleware), things oriented (sensors) and semantic-oriented (knowledge). Although this type of delineation is required due to the interdisciplinary nature of the subject, the usefulness of IoT can be unleashed only in an application domain where the three paradigms intersect."

The IoT can be viewed as an advanced technology that resides on few basic pillars as mentioned below:

(i) Anything is identifiable Anytime and Anywhere
(ii) Anything can communicate at Anytime and Anywhere
(iii) Anything interacts Anywhere and at Anytime

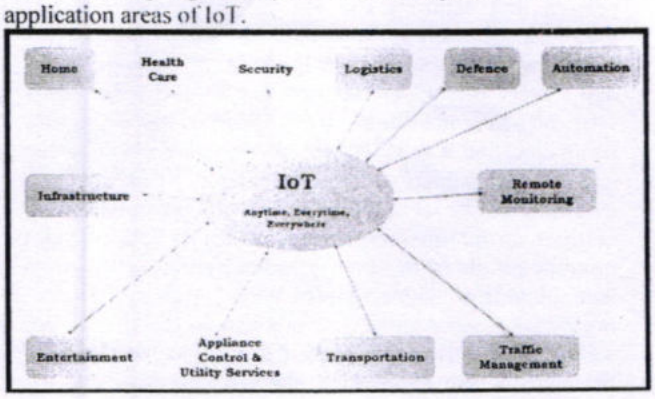


The objects or things defined in the discussion in previous paragraph can be elaborated as mentioned below.

These smart objects/things are physical entities that:

(a) Possess a unique identity
(b) Has some basic computing capability
(c) Can sense some physical parameters like intensity of light/sound, temperature, pressure etc.
(d) Can trigger specific actions based on sensed information
(e) Should produce, consume, and process data and aid in some decision making process.

The following figure depicts the conceptualization and application areas of IoT.



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IoT is an advancing technology that focuses on various aspects which are as mentioned below:
(i) Global Real Time Integration of Objects/Things
(ii) Heterogeneous nature of devices and network infrastructure
(iii) Mobility IoT
(iv) Continuous sensing for collecting data for meaningful information retrieval
(v) Distributed Intelligence
(vi) Continuous Connectivity
(vii) Optimum Processing with Optimum Decision Making Processes
(viii) Cross Platform Services and Utilities

Smart phones, PDA and other handheld devices are changing our environment by making it more interactive as well as informative and in this process a smart environment is created. According to Mark Weiser "the physical world that is richly and invisibly interwoven with sensors, actuators, displays, and computational elements, embedded seamlessly in the everyday objects of our lives, and connected through a continuous network" is termed as a smart environment.[8]The advancements and convergence of micro-electro-mechanical systems (MEMS) technology, wireless communications, and digital electronics has resulted in the development of miniature devices having the ability to sense, compute, and communicate wirelessly in short distances. These miniature devices called nodes interconnect to form a wireless sensor networks (WSN) and find wide application in environmental monitoring, infrastructure monitoring, traffic monitoring, retail, etc.

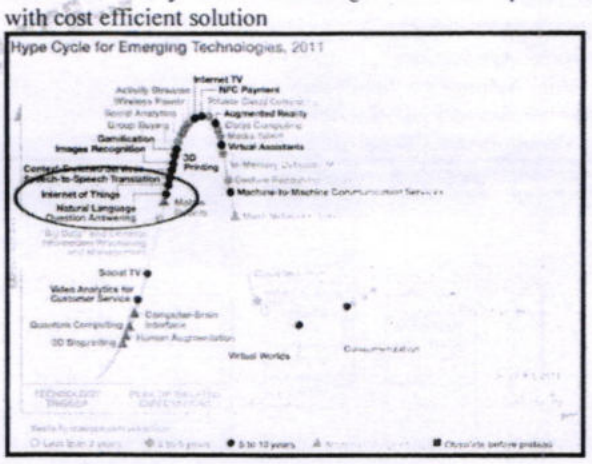
II. IoT ELEMENTS

In this section we have listed and discussed on some key elements for IoT and IoT based applications. If we classify IoT elements/components into few basic categories that aids seamless connectivity then it can be as followed:
a) Hardware
b) Middleware
c) User End Visualization

Hardware constitutes of various sensors, actuators, embedded devices and other communication devices .Middleware constitutes of various tools used for on demand storage of data collected by sensor devices and processed by embedded devices and various computing tools used for data analytics. User End Visualization consists of various data visualization and interpretation tools which can be accessed on various diverse platforms which aids the end user to keep a track of various events driven by those data collected by various sensory hardware's. We have highlighted few breakthrough and enabling technologies in the above mentioned categories which will provide a clear conscience for the three components listed above. Wireless Sensor Network (WSN): The advances in low power integrated circuits and wireless communications has made it a possibility of making available efficient, low cost, low power miniature devices for use in remote sensing applications. These factors has improved the viability and feasibility of utilizing a sensor network consisting of a large number of intelligent sensors, enabling the collection, processing, analysis and dissemination of valuable information, gathered in a variety of environments Radio Frequency Identification (RFID): major breakthrough advancement in the embedded communication paradigm which enables design of microchips for wireless data communication. They help us in automatic identification of anything they are attached to acting as an electronic barcode that can be used in various IoT based applications

III. TRENDS & APPLICATION AREAS

Internet of Things (IoT) has been identified as one of the emerging technologies in IT as noted in Gartner's IT Hype Cycle. A Hype Cycle is a way to represent the emergence, adoption, maturity, and impact on applications of specific technologies. It has been forecasted that IoT will take around 5 to 10 years for full-fledged market adoption and with cost efficient solution



The popularity of different paradigms varies with time. The web search popularity, as measured by the Google search trends during the last 10 years for the terms Internet of Things, Wireless Sensor Networks and Ubiquitous

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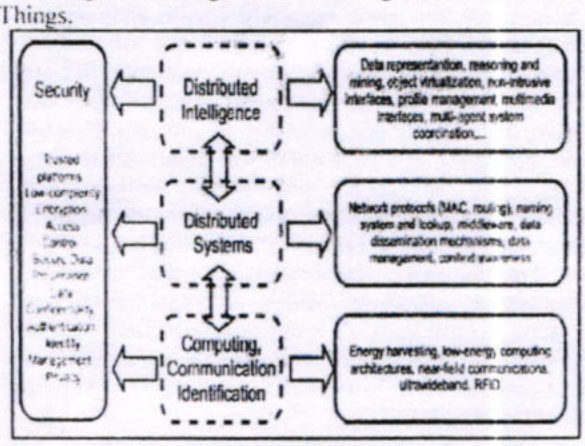
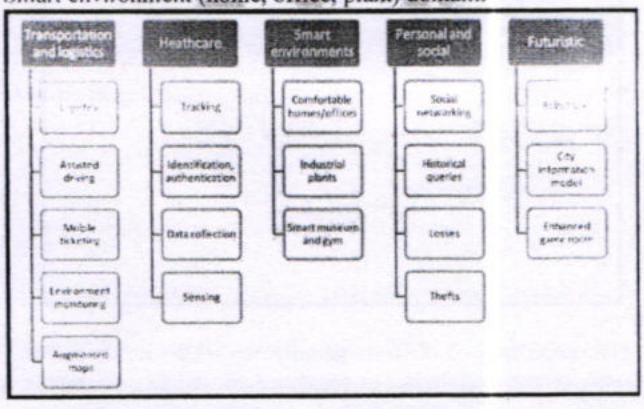
Computing are shown in Figure. As it can be seen, since IoT has come into existence, search volume is consistently increasing with the falling trend for Wireless Sensor Networks. As per Google's search forecast (dotted line). this trend is likely to continue as other enabling technologies converge to form a genuine Internet of Things.



There are various diverse application domains which will be impacted by the emerging technology Internet of Things. The applications can be basically categorized based on the type of network availability, coverage, scale, heterogeneity, repeatability, user involvement and impact. Applications of IoT can be broadly classified in following categories:

Personal and Home Applications
Health Care
Utilities and Services
Enterprise Applications
Industrial Automation Applications
Transportation and logistics domain
Smart environment (home, office, plant) domain.



IV. RESEARCH SCOPE & OPEN ISSUES/CHALLENGES

The taxonomy of main research areas related to IoT has been graphically represented in the figure below. For IoT to be accepted as an efficient technology for various applications efforts are required to be streamlined in development of scalable and suitable service delivery platforms that permits multiple services to coexist.

We have tried to enlist and discuss few key challenges as mentioned below

a) Heterogeneous Things: An IoT empowered framework keeps running with a few heterogeneous gadgets those are diverse to each other as far as correspondence convention, information position information accumulation, and information storage ability and so forth. This is a challenging task to develop communication protocols supported by all devices. Standard information configuration is required to empower machine to machine (M2M) correspondence all the more productively.

b) Energy: The devices forming the base of IoT are wireless in nature and reside at remote places (e.g. environment monitoring sensors) where energy is the most vital issue. We need ultimate energy efficient algorithms and hardware so as to avoid quick draining of battery power and make sensor nodes to live active for longer duration.

c) Security: Much the same as some other framework. security is a standout amongst the most essential issues. This issue turns out to be all the more difficult In an IoT when we are utilizing the system pervasively. We require particular information seclusion methods to give appropriate benefit to the end clients as indicated by their power. Information encryption calculations should be much more grounded. We require specific data isolation techniques to provide proper privilege to the end users according to their authority. Most importantly, the algorithms devised should be energy efficient so that they could be used in very low power, low energy devices across various IoT based applications.

d) Privacy: The pervasiveness and communications included in IoT can give numerous accommodations and helpful administrations for people, additionally make numerous chances to abuse security i.e. it creates many opportunities to violate privacy. To take care of the security issue made by IoT utilizations without bounds. the

protection arrangements for every (framework) space must be determined. Once determined either the individual IoT application or the IoT base (e.g., the utility ability) must uphold security. Consequently paradigm must be able to express users' requests for data access and the policies such that the requests can be evaluated against the policies in order to decide if they should be granted or denied.

e) Intelligence: Machine to machine (M2M) communication has high priority in IoT because machine automation must be improved to minimize delay, traffic. and immediate action. Smart technologies need to be more intelligent to enable automated systems.

f) Communication Protocol: The heterogeneous nature of IoT enabled services meet an unavoidable problem with communication protocols. Each types of device use separate protocol in terms of data communication. Standard communication protocol needs to be developed for successfully implement IoT services.

g) Real-Time Solution: It will be really tough to implement the 'Anytime' concept of IoT in reality. The real- time systems need to be implemented in grass root level of the IoT things to react prominently at any time. The complexity of the existing real-time systems must be minimized, so that they could be used in nano-scopic devices.

h) Creating knowledge and Big Data: In an IoT world there exists a boundless measure of raw information being ceaselessly gathered. It can be normal that an extensive number of continuous sensor information streams exist as it is regular for a given stream of information to be utilized as a part of various routes for a wide range of induction purposes. Here. the information provenance and how it was prepared must be known. and protection and security must be connected as well. At the point when the information is enormous, challenge gets to be greater. Information mining strategies are relied upon to give the making of imperative learning from this information. In IoT framework colossal and tremendous measure of information should be overseen in every second. It is said that 220 Extra bytes of information will be put away in this year. The huge information idea must be executed in IoT to deal with this tremendous measure of information. That is the reason taking care of this enormous measure of information and making learning from it is a noteworthy examination issue for IoT.

V. CONCLUSION

IoT has been continuously bringing a progression of mechanical changes in our day by day lives, which thus makes our life less difficult and more agreeable through different innovations and applications. There is incalculable value of IoT applications in different areas including medicinal, fabricating, mechanical. transportation, training, administration, mining. living space and so on. Notwithstanding plenteous advantages IoT is confronting a few imperfections in administration and execution level. Key perceptions in the writing are as per the following. Firstly, there is no standard definition worldwide till date. Second, widespread institutionalizations are required in structural level as well. Third. as advances shift from seller to-merchant, interoperability issues are to be tended to all the more genuinely. In this paper. we have studied the most imperative parts of the IoT with accentuation on what is being done and what are the issues that require further research. Without a doubt. current advances make the IoT idea possible however doesn't fit well with the versatility and effectiveness prerequisites they will confront. We believe that, given the interest shown by industries in the IoT applications, in the next years addressing such issues will be a powerful driving factor for networking and communication research in both industrial and academic laboratories. In this review article. we tried to provide an overview of the key issues identified with the improvement of IoT advances and administrations. Various examination challenges have been distinguished. which are relied upon to end up significant exploration patterns in the following years. The most pertinent application fields have been discussed, and various cases have been distinguished. We do hope that this survey will be useful for researchers and practitioners in the field of IoT. helping them to understand the huge potential of IoT and also highlighted which are the major issues to be tackled. devising innovative technical solutions able to turn IoT from a research vision into reality.

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Internet of Things (IoT)

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Abstract:- **This presentation mainly focuses on the Internet of Things (IoT).The Internet of things (IoT) is the network of physical devices, vehicles, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor or an automobile with built-in-sensors, i.e. objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken.**

I. INTRODUCTION

As of 2017, the vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, Commodity sensors and embedded systems. This means that the traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of things (IoT). According to a technology research and advisory corporation, there will be nearly 20.8 billion devices on the Internet of things by 2020. It estimates that more than 30 billion devices will be wirelessly connected to the Internet of things by 2020.

Some other major applications are Media, Environmental monitoring, Infrastructure Management, manufacturing, agriculture, energy management, medical and health care, building, home automation, transportation, metropolitan scale development.

APPLICATIONS OF IoT

Environmental monitoring applications of the IoT typically use sensors to assist in environmental protection by monitoring air or water quality, atmospheric or soil conditions,and can even include areas like monitoring the movements of wildlife and their habitats. Development of resource-constrained devices connected to the Internet also means that other applications like earthquake or tsunami early-warning systems can also be used by emergency services to provide more effective aid. IoT devices in this application typically span a large geographic area and can also be mobile. It has been argued that the standardization IoT brings to wireless sensing will revolutionize this area.

MEDIA - In order to hone the manner in which things, media and big data are interconnected, it is first necessary to provide some context into the mechanism used for media process. It has been suggested by Nick Couldry and Joseph Turow that practitioners in media approach big data as many actionable points of information about millions of individuals. The industry appears to be moving away from the traditional approach of using specific media environments such as newspapers, magazines, or television shows and instead tap into consumers with technologies that reach targeted people at optimal times in optimal locations.

Infrastructure management

Monitoring and controlling operations of urban and rural infrastructures like bridges, railway tracks, on- and offshore-wind-farms is a key application of the IoT. The IoT infrastructure can be used for monitoring any events or changes in structural conditions that can compromise safety and increase risk. It can also be used for scheduling repair and maintenance activities in an efficient manner, by coordinating tasks between different service providers and users of these facilities.IoT devices can also be used to control critical infrastructure like bridges to provide access to ships. Usage of IoT devices for monitoring and operating infrastructure is likely to improve incident management and emergency response coordination, and quality of service, up-times and reduce costs of operation in all infrastructure related areas. Even areas such as waste management can

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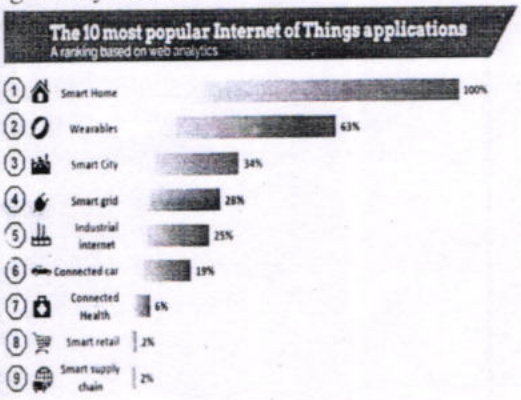
benefit from automation and optimization that could be brought in by the IoT.



Manufacturing

Network control and management of manufacturing equipment, asset and situation management, or manufacturing process control bring the IoT within the realm of industrial applications and smart manufacturing as well.TheIoT intelligent systems enable rapid manufacturing of new products, dynamic response to product demands, and real-time optimization of manufacturing production and supply chain networks, by networking machinery, sensors and control systems together.

Digital control systems to automate process controls, operator tools and service information systems to optimize plant safety and security are within the purview of the IoT.But it also extends itself to asset management via predictive maintenance, statistical evaluation, and measurements to maximize reliability. Smart industrial management systems can also be integrated with the Smart Grid, thereby enabling real-time energy optimization. Measurements, automated controls, plant optimization, health and safety management, and other functions are provided by a large number of networked sensors.

Agriculture

The IoT contributes significantly towards innovating farming methods. Farming challenges caused by population growth and climate change have made it one of the first industries to utilize the IoT. The integration of wireless sensors with agricultural mobile apps and cloud platforms helps in collecting vital information pertaining to the environmental conditions temperature, rainfall, humidity, wind speed, pest infestation, soil humus content or nutrients, besides others – linked with a farmland, can be used to improve and automate farming techniques, take informed decisions to improve quality and quantity, and minimize risks and wastes. The app-based field or crop monitoring also lowers the hassles of managing crops at multiple locations. For example, farmers can now detect which areas have been fertilized (or mistakenly missed), if the land is too dry and predict future yields.

Energy management

Integration of sensing and actuation systems, connected to the Internet, is likely to optimize energy consumption as a whole.It is expected that IoT devices will be integrated into all forms of energy consuming devices (switches, power outlets, bulbs, televisions, etc.) and be able to communicate with the utility supply company in order to effectively balance power generation and energy usage. Such devices would also offer the opportunity for users to remotely control their devices, or centrally manage them via a cloud-based interface, and enable advanced functions like scheduling (e.g., remotely powering on or off heating systems, controlling ovens, changing lighting conditions etc.).

Medical and healthcare

IoT devices can be used to enable remote health monitoring and emergency notification systems. These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fitbit electronic wristbands, or advanced hearing aid. Some hospitals have begun implementing "smart beds" that can detect when they are occupied and when a patient is attempting to get up. It can also adjust itself to ensure appropriate pressure and support is applied to the patient without the manual interaction of nurses.

Building and home automation

IoT devices can be used to monitor and control the mechanical, electrical and electronic systems used in various types of buildings (e.g., public and private, industrial, institutions, or residential)[49] in home automation and building automation systems. In this context, three main areas are being covered in literature.

Transportation

The IoT can assist in the integration of communications, control, and information processing across various transportation systems. Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle, the infrastructure, and the driver or user). Dynamic interaction between these components of a transport system enables inter and intra vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistic and fleet management, vehicle control, and safety and road assistance.[49] In Logistics and Fleet Management for example, The IoT platform can continuously monitor the location and conditions of cargo and assets via wireless

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sensors and send specific alerts when management exceptions occur (delays, damages, thefts, etc.).

Consumer application

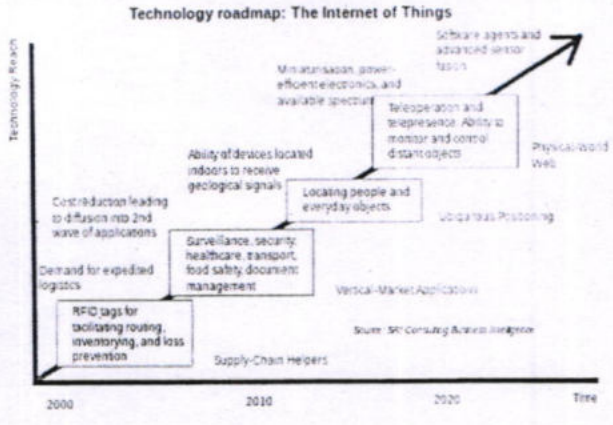
A growing portion of IoT devices are created for consumer use. Examples of consumer applications include connected car, entertainment, residences and smarthomes, wearable technology, quantified self, connected health, and smart retail.Consumer IoT provides new opportunities for user experience and interfaces.

Some consumer applications have been criticized for their lack of redundancy and their inconsistency, leading to a popular parody known as the "Internet of things".Companies have been criticized for their rush into IoT, creating devices of questionable value,and not setting up stringent security standards.

UNIQUE ADDRESSABILITY OF THINGS;-

Integration with the Internet implies that devices will use an IP address as a unique identifier. Due to the limited address space of IPv4 (which allows for 4.3 billion unique addresses), objects in the IoT will have to use the next generation of the Internet protocol (IPv6) to scale to the extremely large address space required.Internet-of-things devices additionally will benefit from the stateless address auto-configuration present in IPv6, as it reduces the configuration overhead on the hosts,and the IETF 6LoWPAN header compression. To a large extent, the future of the Internet of things will not be possible without the support of IPv6; and consequently, the global adoption of IPv6 in the coming years will be critical for the successful development of the IoT in the future. A combination of these ideas can be found in the current GS1/EPCglobal EPC Information Services specifications. This system is being used to identify objects in industries ranging from aerospace to fast moving consumer products and transportation logistics.

Trends and characteristics



Technology roadmap: Internet of things.

The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data.

Intelligence

Complexity

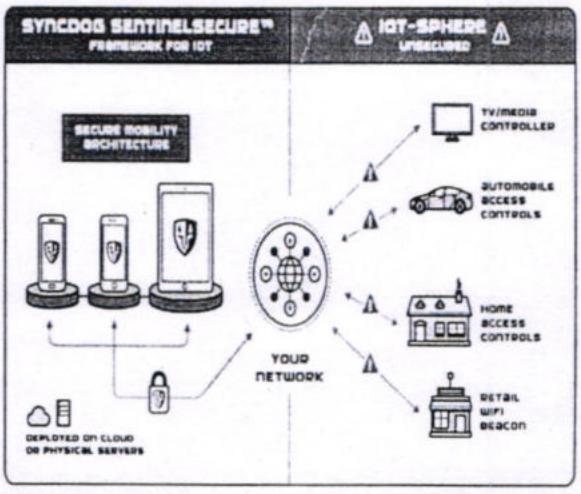
Size considerations

Sectors

ASolutionto "basketofremotes"

Frameworks

IoT frameworks might help support the interaction between "things" and allow for more complex structures like distributed computing and the development of distributedapplications. Currently, some IoT frameworks seem to focus on real-time data logging solutions, offering some basis to work with many "things" and have them interact. Future developments might lead to specific software-development environments to create the software to work with the hardware used in the Internet of things. Companies are developing technology platforms to provide this type of functionality for the Internet of things. Newer platforms are being developed, which add more intelligence.



REST is a scalable architecture that allows things to communicate over Hypertext Transfer Protocol and is easily adopted for IoT applications to provide communication from a thing to a central web server.

Enabling technologies for IoT;-

There are many technologies that enable IoT. Crucial to the field is the network used to communicate between devices of an IoT installation, a role that several wireless or wired technologies

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Intellect: A Brain Controlled Multi-User Video Game For Enhancing Cognition

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Abstract:- **Brain-Computer Interface (BCI);- A Brain-Computer Interface (BCI) enables communication data recorded from the brain. WIRELESS—EEG The advancement of wireless EEG (electroencephalogram) sensor technology is rapidly changing the way we interact with the world. Many people suffer from lack of concentration and short memory issues. In this paper, we are proposing a gaming platform named intellect that has controlled by our brain signals. For collecting the brain signals we are using wireless EEG technology. α, β or γ activity of EEG signals represent a cognitive state of the human brain. Intellect is designed in such a way that the game only starts functioning whenever our brain state is inattention or cognitive mode. The harder you concentrate it will redirect you to the next levels. This will help the person to improve the cognitive capacity of his brain.**

Keywords: **BCI, WSN, EEG, FFT.**

I. INTRODUCTION

Many people suffer from lack of concentration and short memory issues. Whether students are attentive in their class or not are a very important issue. Here we are proposing a multi-user game environment that will help the people to improve their cognitive skills like concentration, memory etc., For that we are using the help of BCI and wireless technology. Waves are a means of transferring energy, without actually transporting matter. Wavemotion transfers the energy from one point to another, which displaces particles of the transmission medium–that is, with little or no associated mass transport. Waves consist, instead, of oscillations or vibrations (of a physical quantity), around almost fixed location. Fig 1.1 shows different types of waves.Now world transfers information in waves than by words. Every source generates the required waves, when brain becomes the source then, at the root of all our thoughts, emotions and behaviors is the communication between neurons within our brains, producing brain waves.

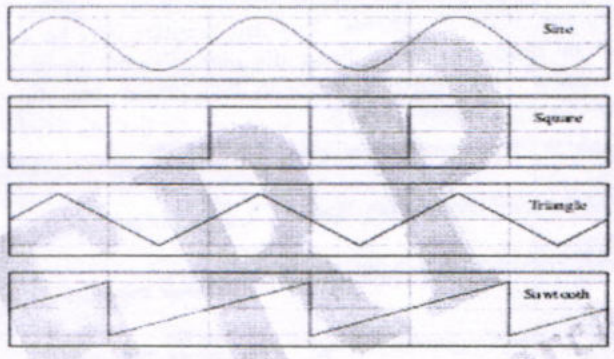

Fig1.1 Different types of waves

What are Brain Waves?

Brainwaves are produced by synchronized electrical pulses from masses of neurons communicating with each other. Brainwaves are detected using sensors placed on the scalp. They are divided into bandwidths to describe their functions (below), but are best thought of as a continuous spectrum of consciousness; from slow, loud and functional – to fast, subtle, and complex. Our brainwaves change according to what we do and feel. When slower brainwaves are dominant we can feel tired, slow, sluggish, or dreamy. The higher frequencies are dominant when we feel wired, or hyper-alert. The descriptions that follow are only broad descriptions - in practice things are far more complex, and brainwaves reflect different aspects when they occur in different locations in the brain. Brainwave speed is

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measured in Hertz (cycles per second) and they are divided into bands delineating slow, moderate, and fast waves.

Brain-Computer Interface (BCI)

A Brain-Computer Interface (BCI) enables communication data recorded from thebrain, the BCI processes it, interprets the intention of the user, and acts on it. The BCI has a robust and flexible design that can be expanded in the future to encompass more complex communication schemes.

1.3 ELECTROENCEPHALOGRAM(EEG)

An electroencephalogram (EEG) is a test used to evaluate the electrical activity in the brain. Brain cells communicate with each other through electrical impulses. An EEG can be used to help detect potential problems associated with this activity. An EEG system tracks and records brain wave pattern. Small flat metal discs called electrodes (sensors) are attached to the scalp with wires. The electrodes analyze the electrical impulses in the brain and send signals to a computer that records the results. The electrical impulses in an EEG recording look like wavy lines with peaks and valleys. These lines allow doctors to quickly assess whether there are abnormal patterns. Any irregularities may be a sign of seizures or other brain disorders. Based on the frequency range, EEG signals can be divided into the following five wavebands.[1]

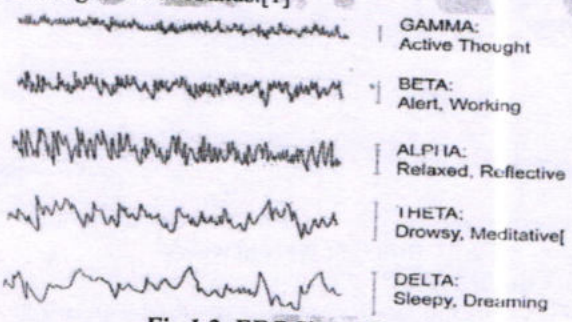

Fig 1.2. EEG Signal Bands

α activity: electromagnetic waves ranging between 8 and 13 Hz in frequency, and between 30 and 50 μV in amplitude. This type of periodic wave is produced in the parietal and occipital regions of the brain when in a state of consciousness, quiet, or at rest. When thinking, blinking, or otherwise stimulated, α wave disappear. This is known as an alpha block.

β activity: electromagnetic waves ranging between 14 and 30 Hz in frequency, and between 5 and 20 μV in amplitude. This type of activity occurs in the frontal region when people are conscious and alert. These waves are particularly apparent when a person is thinking or receiving sensory stimulation.

θ activity: electromagnetic waves ranging between 4 and 7 Hz in frequency, with an amplitude of less than 30 μV. This activity primarily occurs in the parietal and temporal regions of the brain. Such waves are produced when people experience emotional pressure, interruptions of consciousness, or deep physical relaxation.

δ activity: electromagnetic waves ranging between 0.5 and 3 Hz in frequency, and between 100 and 200 μV in amplitude. In a conscious state, most adults exhibit almost no δ activity; instead, this activity occurs when in a deep sleep, unconscious, anesthetized, or lacking oxygen.

γ activity: electromagnetic waves ranging between 31 and 50 Hz in frequency, and between 5 and 10 μV in amplitude. Recent studies have found that γ activity is related to selective attention. Other studies have also highlighted that this activity is related to cognition and perceptual activity

Wireless EEG: The advancement of wireless EEG (electroencephalogram) sensor technology is rapidly changing the way we interact with the world. Through the use of EEG headsets, EEG sensors measure the brain's electrical activity, or brainwaves. In early research, EEG testing was invasive and complex. It typically involved the use of silver needles and electrode attachments to the scalp, and had to be done in hospitals or research settings. Fig 1.3 shows a Wireless EEG set up.

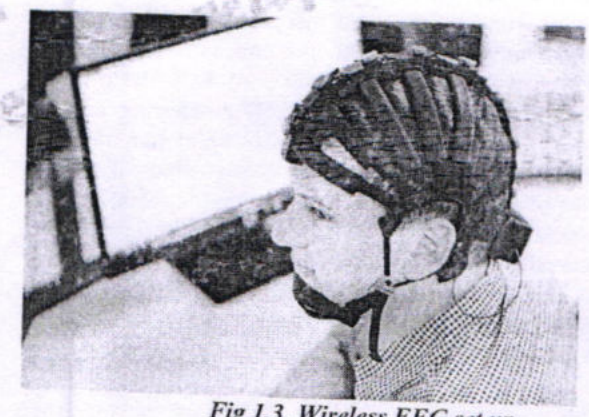

Fig 1.3. Wireless EEG set up

II. INTRODUCING DEEP LEARNING AND ARTIFICIAL NEURAL NETWORKS ;-

2.1 Deep learning (also known as deep structured learning or hierarchical learning) is part of a broader family of machine learning methods based on learning data representations, as opposed to task-specific algorithms.

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5.2. Signal Processing Unit
EEG signal processing unit transform raw EEG signals into class estimated mental states of the user. This transformation is achieved using a pattern recognition approach, whose two main steps are the following:

Feature Extraction: In this step EEG signals are grouped into some patterns known as features that are relevant to describe the mental states to identify, while rejecting the noise and other non-relevant information.

Classification: In this step we assign a class to a set of features. This class corresponds to the kind of mental state identified.Previous works in feature extraction and classification are used FFT (fast Fourier transform) But for noisy signals the SVM (support vector machine) technique shows better results compared to FFT. So here we are using SVM for classification. This module classify the EEG raw signal into α , β, θ, δ and γ patterns. But we are only interested in α,θ and γ patterns. So SVM classify these 3 patterns only.

5.3. Command Generator module Threeparameters, the ratio of alpha power to theta power denoted asα / θ, ratio of beta to alpha power denoted as β / α and γ are extracted from second module to assess the attention level of the players.The α / β value increases when player begins to concentrate on the video whereas α / β significantly increases when player is focusing and/or actively thinking. γ values indicate other cognitive features. We calculated three threshold values that are used to calculate the concentration levels of user.
Based on these values, the game moved into different levels.

5.4. Gaming Interface
Purposiveness;-
Goals: The goal of the game is to stay safe and survive the entire time you stay on the game's sight.
Challenges: As concentration is the main trigger to start the game, the player has to maintain his/her clam state and at the same time in the movements.
Navigation:-
Reversibility: Navigation is almost, always reversible. Entering a room through a doorway means that you can exit the room using it as well. This lets the gamer know that exploration is (usually) harmless and is therefore encouraged, since any navigation act can be undone simply and naturally.

Mystery: Not all of the space is revealed at once. Gamers have to travel around to see new things. Of course, once a thing or a place is seen a few times it might be reachable much more easily by other means.

Reality: Every movement takes a certain amount of time regardless of how fast the computation could actually occur. This increases the sense of objects being moved, or distance being covered.

Reality cues:-
Sounds: Incidental or background sounds (wind, water, surf, birds, insects, animals, machines) give cues about location and state and thereby increase the believability of the scene.

Music: Music soundtracks for cutscenes heighten the sense of motion between locations.
Animation: Smooth animation increases the believability of active entities in the space and helps place gamers in the space as they move through it.

Solidity: Objects are three-dimensional and texture-mapped. Animated objects move under acceleration; they don't simply have constant velocity.

Stability: Objects don't arbitrarily change size or position.

Shadows: Light has a source and objects cast shadows.

Realism: Instead of buttons and menus and text, controls are more interesting: your concentration on what you will to do. Realistic controls make it easier to see what state a controller is in.

Interaction:-
Feedback: Newton's Fourth Law of Games: Controls give immediate visual and aural feedback. This gives the gamer a feeling of being in direct control---things in the world exist and can be directly manipulated.

Unity: Controls are embedded in the space, not external to it. This increases the closure of the space and aids belief in its existence as a real place. For example, games don't have scroll controls; seeing more of the scene is as natural as turning in the real world.

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Learning can be supervised, partially supervised or unsupervised.

Deep learning architectures such as deep neural networks, deep belief networks and recurrent neural networks have been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation and bioinformatics where they produced results comparable to and in some cases superior to human experts.

2.2 Artificial neural networks (ANNs),a form of connectionism are computing systems inspired by the biological neural networks that constitute animal brains. Such systems learn (progressively improve performance) to do tasks by considering examples, generally without task-specific programming. For example, in image recognition, they might learn to identify images that contain cats by analyzing example images that have been manually labeled as "cat" or "no cat" and using the analytic results to identify cats in other images. They have found most use in applications difficult to express in a traditional computer algorithm using rule-based programming.

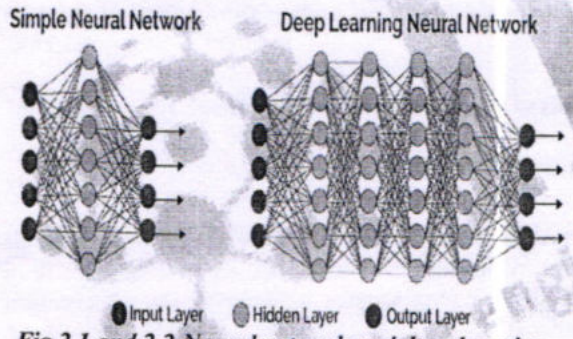

Fig 2.1 and 2.2 Neural network and deep learning.

III. RELATED WORKS

The Adventures of NeuroBoy [2] –As NeuroBoy, you will use your special telekinetic powers to push, pull, lift or burn objects. Different objects in the world weigh different amounts, so you will need to flex your mental muscle to pick up the heavier items. Papers [3],[4],[5] and [6] explain different mechanisms to in cooperate BCI systems to gaming and other machine control.

IV. PROPOSED WORK-INTELLECT

A game designed with the wireless EEG concept Intellect, works with your mind and its present mood. Fig 4.1 and 4.2 shows the inner and the outer look of the game platform. Distributed applications commonly require the sharing of computation and storage between their components. In this project, we have used a distributed architecture for playingvideo games with the brain signals. While mobility has been added by introducing a wireless EEG acquisition machine and wireless application device, performance is kept the same as previous BCI solutions. This has been done by keeping the entire computational intensive tasks (e.g. machine learning and signal processing) on the stationary base computer like laptop.

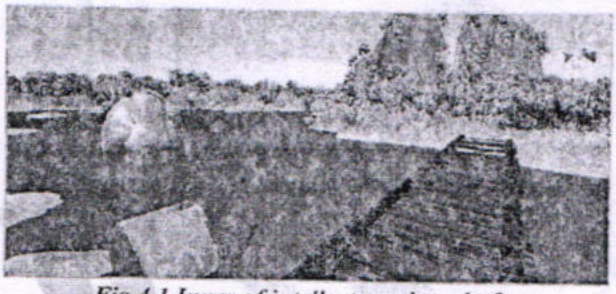

Fig 4.1 Inner of intellect gaming platform

Fig 4.2 Outer view of intellect gaming platform

Intellect consist of a signal acquisition unit using EMOTIV's EPOC wireless EEG headset, a signal processing unit in server system, mental state to command generator module and a gaming interface created in C#.

5.1. Signal Acquisition Unit (EPOC Wireless Headset)

The data acquisition is done by Emotiv Epoc neuro headset. EPOC is a low cost EEG recording device comprised of 14channels of EEG data. The electrodes are located at positionsAF3, F7, F3, FC5, T7, P7, O1, O2, P8, T8, FC6, F4, F8 and AF4. The EPOC internally samples at a frequency of 2048 Hz which is then down-sampled to 128Hz per channel and the data is then sent to a computer viaBluetooth. It utilizes a proprietary USB dongle tocommunicate using the 2.4 GHz band. Prior to use, all feltpads on top of the sensors have to be moistened with a saline solution[7].

VI. CONCLUSION

This paper proposed a 3-D video game driven by EEG features related to different levels of attention and a set of keyboard inputs. The game named as "INTELLECT" employs sample entropy as well as band power estimates of alpha, beta and theta rhythms of EEG to differentiate between different brain states of players. The complex attention control mechanism proposed in this paper helps players to improve attention and over all game control skills. SVM technique used for classification helps to improve the accuracy of the system. Further experimental analysis is necessary to make the control mechanism simpler and more robust for optimizing the benefits of neuro-feedback training. As a future work we are planning to add deep learning technique for automatic game playing.

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Information Sharing by Block Chain Technology for Supply Chain Management

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Abstract: - **The management of upstream and downstream value-added flows of materials, final goods, and related information among the companies, distributors, resellers, and final customers can be termed as the main objective of Supply Chain Management. But, at times due to base on virtual data, there occur chances of the failure of the algorithm used to devise the flow plan due to the variations, in the information shared among the people in the supply chain. The data shared between manufacturers, suppliers and customers are affected.**

Keywords— Supply chain management; Blockchain; SCM

I. INTRODUCTION

Now, high pressure on the prices and the global competition forced manufacturers to focus on their core competences like engineering and final assembly as original equipment manufacturers thus outsourcing almost the whole manufacturing operations. These higher levels of complexity are the result of random changes in manufacturing and distribution, including globalization and outsourcing. As a result, independent firms manage different parts of global supply chains. Each firm in the supply chain sets strategic and operational goals to maximize its own profit by using local information such as cost structures, profit margins and forecasts. Even though advances in information technology enable firms to collect, process, and share information, firms may be reluctant to do so because of conflicting incentives. Aligning incentives improves firms' profits and sustains the use of information technology. In this situation, it is important to build competitive supply chain. To build it, Information in supply chains is one of the most valuable resources for manufacturers. The coordination of information, as well as operations and logistics optimization, has become increasingly order to overcome this problem, it is necessary to ensure reactivity towards markets variability. Especially, Double Benefit for the distributors is a widespread and serious problem in supply chain management which leads to supply insufficiencies, in the cases of both deterministic and random demands. This paper proposes a Block Chain based solution to address the problems of supply chain such as Double Marginalization I.e. Double Benefits and Variations in Shared Information etc

The main motto of this paper to avoid the customer of facing a double marginalization problem, it may cause by the suppliers of the company.

II. PROBLEM OF SUPPLY CHAIN

Demand forecasting is becoming difficult because of short product life cycles and long production lead-times. Then, supply chains face the risk of either excess capacity due to low demand realization or lack of product availability. In a decentralized supply chain, lack of proper capacity risk sharing increases the cost of capacity risk. To deliver on time, the contract manufacturer secures capacity in advance of an original equipment manufacturer order. For such a supply chain, if consumer demand turns out to be high, both the contract manufacturer and the original equipment manufacturer face upside capacity risk. However, if consumer demand turns out to be low, only the contract manufacturer faces downside capacity risk To reduce capacity risk for each party depends on the contractual agreements. Under a wholesale price contract, the original equipment manufacturer pays a wholesale price W to the contract manufacturer for each unit ordered and sells the product to the market at R per unit. The contract manufacturer secures capacity at a unit cost of C, which could represent an equivalent annual cost of capacity. So, the contract manufacturer's

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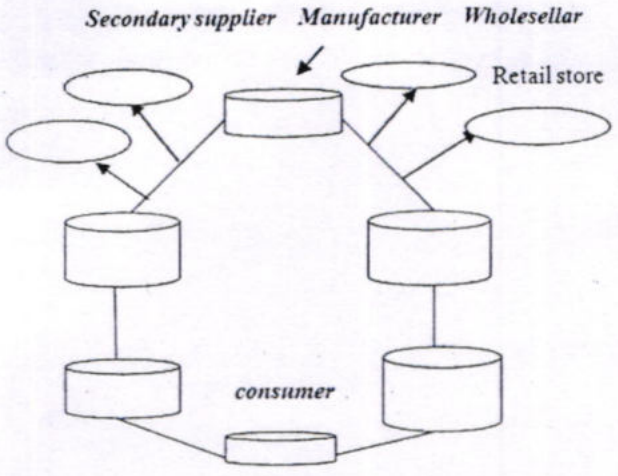
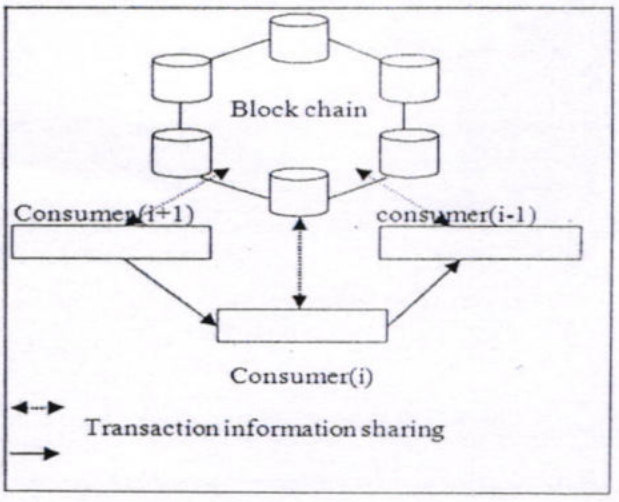
marginal profit W-C is less than the vertically integrated supply chain's marginal profit R-C. This difference is known as double marginalization. The contract manufacturer protects itself by securing less capacity than what would be optimal for a vertically integrated supply chain. The original equipment manufacturer may eliminate this adverse effect of decentralization by sharing the contract manufacturer's upside capacity risk. Thus, the contract manufacturer's marginal cost is C, whereas the original equipment manufacturer's marginal cost is zero. This all transaction makes the consumer to face the Double marginalization problem. To maximize profit of each party, the original equipment manufacturer can agree to pay back P per unit of unused capacity. This would reduce the contract manufacturer's marginal cost to C-P, and induce the contract manufacturer to build a higher capacity, thus aligning incentives. We refer to this as a payback contract. But this payback contract deals between contract manufacturer and original equipment manufacturer order, this will not give solution for consumer/customer problem. So, to prevent the double benefit to the supplier of the companies by cheating a consumer. We must provide the proper communication or interaction between each domain of the companies with the consumer using the supply chain management(SCM)and Block chain concept.

Fig:1 Information sharing using SCM



III. PROPOSED SOLUTION

Previous research works have discussed the benefits of information sharing throughout the supply chain. Sharing data such as machine loads, sales previsions and inventory positions has proven to improve the fulfil rate and the product cycle time and to decrease order fluctuations. However, it is difficult to share information in global supply chain because there are many code schemes. Using EDI network is an easy solution to integrate code schemes and realize visibility of supply chain, but it is expensive especially for small businesses. If they try to integrate their code schemes and realize visibility of supply chain by using same ERP package such as SAP, it makes another problem. Most companies don't necessarily want to share information, because they don't want to share their capacity with competitors. It is also necessary to consider about access control on information sharing scheme. It can be difficult to receive and interpret status updates from numerous carriers, brokers, and freight forwarders to gain a comprehensive perspective and assess performance and bottlenecks. Without this bird-eye's perspective, it becomes nearly impossible to implement cost-saving strategies, such as just-in-time inventory replenishment. When delivery windows are tight, even minor missteps and miscalculations can have major cost and service level consequences. For satisfying these requirements, we consider low cost and access controllable database system. In recent years, a new distributed database system emerged. The system was Bitcoin, which allows users to transfer currency (bitcoins) securely without a centralized regulator, using a publicly verifiable open ledger (or blockchain). Since then, Bitcoin demonstrated how these blockchains can serve other functions requiring trusted computing and auditability. While companies earn the benefits of information sharing via blockchain, there is growing a company's concern about protection of the order content. So, there is a possibility to satisfy the requirements as mentioned above.



IV. RELATED WORKS

There have been various attempts to address data protection issues. Across the industry, leading companies chose to implement their own proprietary authentication software based on the OAuth protocol, in which they serve as centralized trusted authorities. From a security perspective, researchers developed various techniques targeting data protection concerns focused on transaction data. Data anonymization methods attempt to protect personally identifiable information. k-anonymity, a common property of anonymized datasets requires that sensitive information of each record is indistinguishable from at least k_1 other records. Related extensions to k-anonymity include l-diversity, which ensures the sensitive data is represented by a diverse enough set of possible values; and t-closeness, which looks at the distribution of sensitive data. Recent research has demonstrated how anonymized datasets employing these techniques can be de-anonymized given even a small amount of data points or high dimensionality data. Other data preserving methods include differential protection, a technique that perturbs data or adds noise to the computational process prior to sharing the data and encryption schemes that allow running computations and queries over encrypted data. As you know, there are similar schemes such as smart contract. NXT is a public blockchain platform which includes a selection of smart contracts that are currently live. Ethereum is a public blockchain platform which is currently the most advanced smart contract enabled blockchain. With a "Turing complete" coding system, theoretically you can put any logic into an Ethereum smart contract, and it will be run by the whole network. There are mechanisms in place to prevent abuse, and you need to pay for compute power, by passing in "ETH" tokens, which act as payment for the miners who run your code. Enigma provides the first solution for protecting data-in-use. Share data with others for processing without giving it away. Data are guaranteed to be encrypted always, even when complex analytics are required. Our blockchain scheme has no valuable things such as virtual currency to avoid hacking. Miner can earn the transaction fee and it uses only computational power in the network.

V. CONCLUSION

In this paper, we proposed a new blockchain scheme for information sharing. It brings many benefits for supply chain management. In general, Transaction data should not be trusted in the hands of third-parties, where they are susceptible to steals and misuse. Instead, users should own and control their data without compromising security or limiting companies' and authorities' ability to provide encrypted transactions. Our platform enables this by combining a blockchain with a homomorphic encryption solution. Users are not required to trust any third-party and are always aware of the data that is being collected about them and how it is used. In addition, the blockchain recognizes the users as the owners of their encrypted data. Companies, in turn, can focus on utilizing data without being overly concerned about properly securing and compartmentalizing them Furthermore, with a decentralized platform, making legal and regulatory decisions about collecting, storing and sharing sensitive data should be simpler. Moreover, laws and regulations could be programmed into the blockchain itself, so that they are enforced automatically. In other situations, the ledger can act as legal evidence for accessing (or storing) data. We recognize some problems to be solved. For example, Search operation for emergency order brings heavy load to Miner. We need to consider about efficient incentive mechanism.

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Industrial Automation Using Internet of Things (IoT)

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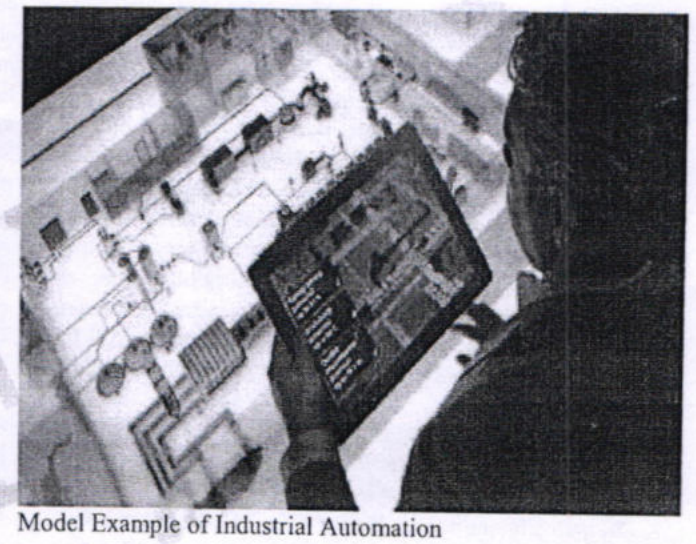
Abstract: - **In this paper, we have presented the present status of industrial automation using IoT. The internet of things is a network of the physical object that contains embedded technology essence communicate with the extrinsic environment. The industrial internet of thing is part of the internet of thing that focuses on devices and object used in a business setting.The vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors, and embedded systems. No ways to detect the un-even condition. Manual intervention required for monitoring. CCTV used which only monitor but no Alert generation.It helps to connect everything around you to the internet including wearable devices, metering devices and an environmental sensor.This paper summarizes the current applications and implementation of IoT in the automation industry.In future, we hope that IoTs will further enhance and make a revolution in industry and also in home appliances.**

Keywords--- **Automation, IoT, sensors, Artificialintelligence, Embedded electronics.**

I. INTRODUCTION

Industrial Internet of Things (IoT) is the best way of connecting industrial machineries and sensors, to each other, over the internet, allowing the authorized user of the industry to use information from these connected devices to process the obtained data in a useful way. IoT-connected applications typically support data acquisition, aggregation, analysis, and visualization. The IoT architecture includes latest technologies such as computers, intelligent devices, wired and wireless communication and cloud computing. Previously Bluetooth and RF (Radio Frequency) technologies were used to control and monitor the industrial applications but were limited to short distance. The operator had to be in the range of the Bluetooth connectivity or in the Radio Frequency area .Solution to the short distance communication is the IoT based industry automation. Here we can have controlling as well as monitoring from anywhere in the world.



Model Example of Industrial Automation

II. HISTORY

First time automation in industries was done through the use of steam and water power. As the advancement took place, electricity was introduced and was used in industries for mass production. The term Internet of Things is 16 years old. But the actual idea of connected devices had been around longer, at least since the 70s. Back then, the idea was

often called "embedded internet" or "pervasive computing". But the actual term "Internet of Things" was coined by Kevin Ashton in 1999 during his work at Procter&Gamble. Ashton who was working in supply chain optimization, wanted to attract senior management's attention to a new exciting technology called RFID. Because the internet was the hottest new trend in 1999 and because it somehow made sense, he called his presentation "Internet of Things". Even though Kevin grabbed the interest of some P&G executives, the term Internet of Things did not get widespread attention for the next 10 years.

III. CURRENT TECHNOLOGY

When computers were invented, it was designed to perform multiple functions. As time went on, computers became cheaper and then almost all industries started using it for automation because it reduced a major work load experienced by the humans and still it is considered as the best option to control and monitor a application. Automation is done through the technologies such as Bluetooth and radio frequency which can be employed for short distance communication.

The following six use cases are examples of how manufacturers are putting IIoT to smart business use:

1. Rapid Costing: In many industries, manufacturing functions are considered as internal suppliers to the product management group or the sales team and, therefore, must provide cost estimates during tendering and business developmentcycles. Tough market dynamics require rapid costing on price indications about a particular piece of equipment, and this quick turnaround can be a decisive factor in whether the enterprise wins or loses major orders. Historical data including hit-rates, customer preferences, footprint requirements, past tendering records, executed projects and product definitions must be combined in an IIoT strategy to inform tendering feedback, reduce lead time and increase quality of tendering.

2. Non-Conformance Report (NCR) Analytics: Manufacturing organizations usually collect data points regarding non-conforming events that arise on the factory floor. An NCR is issued when a product, process or procedure does not comply with set standards. It can also represent a significant deficiency. An NCR is generally used as a tool to reduce errors as much as possible and keep faulty products and equipment from reaching customers. IIOT technologies can help analyze NCR data, find relationships between NCRs and support the prediction of future non-conformances.

3. Plant Load Optimization: Sales and Operations Planning (S&OP) processes are the core of a manufacturing company. They allow management not only to get a handle on the business but also to create a command and control system that integrates strategic business plans and tactical day-to-day operations. S&OP helps guide daily operations and monthly plans toward long-term business goals and aligns manufacturing, suppliers and customers. Depending on the product's lifecycle, the S&OP process can define the load forecast over time, which helps determine which products an enterprise will manufacture at which plant—and creates the basis for plant loading. This decision has implications on operational and financial performance. Historical load, industrial footprint, executed projects, scope changes and customer behavior are data points that can optimize plant loading. To understand and balance the trade-offs to optimize loading requires an IIoT strategy.

4. Shop Floor Operational Improvements: Manufacturers are increasingly interested in the use of low-cost sensors attached to machines for preventive maintenance and condition-based monitoring. Some are finding wireless connectivity and big data processing tools can make it cheaper and easier to collect actual performance data and monitor equipment health. For example, critical machine tools are designed to operate within certain temperature and vibration ranges. Sensors that can actively monitor and send an alert when the tool deviates from these prescribed parameters can aid in preventing malfunctions. When critical equipment fails, operations can quickly fall behind and miss on-time delivery, leading to delayed projects and cost overruns. Big data in an IIoT solution can help improve overall equipment effectiveness (OEE), minimize equipment failure and enable proactive maintenance to reduce or eliminate downtime.

5. Suppliers and Supply Chain: Access to real-time supply chain information helps identify issues before they happen, reduces inventory and potentially reduces capital requirements. The IIoT can help manufacturers gain a better understanding of this information. By connecting plants to suppliers, all parties involved in the supply chain can trace interdependencies, material flow and manufacturing cycle times. IIoT-enabled systems can be configured for location tracking, remote monitoring of inventory and reporting of parts and products as they move through the supply chain. They can also collect and feed delivery information into ERP, PLM and other systems.

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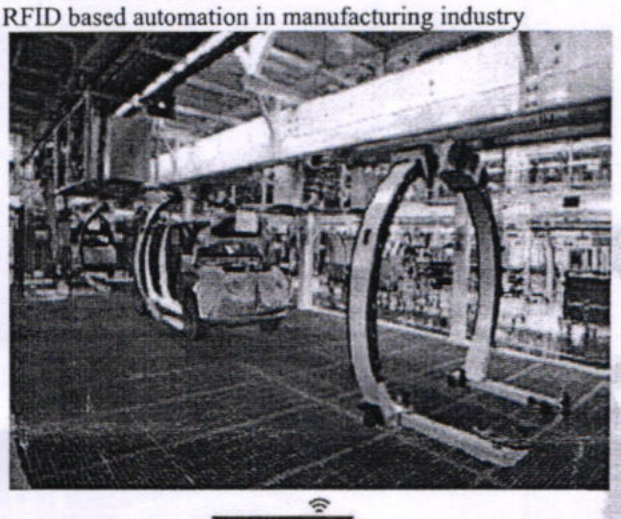
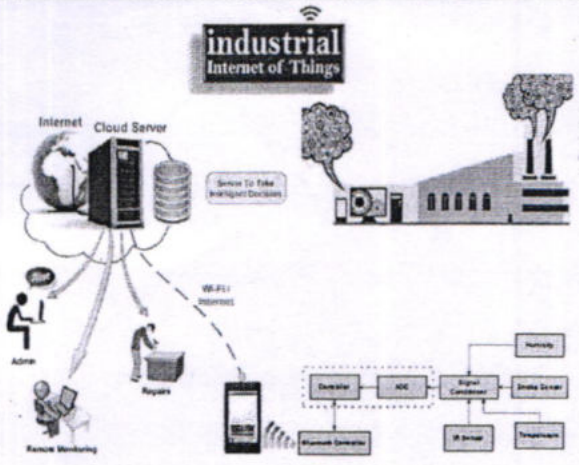
6. Health, Safety and Environment: Key Performance Indicators (KPIs) for health, safety and environment (HSE) include data for injury and illness rates, short- and long-term absences, near-misses, vehicle incidents and property damage or loss during daily operations. These measurements are typically stored in myriad systems, spreadsheets and emails and are reported sporadically during management reviews or audits. Lagging indicators do not have any relational value and companies rarely perform thorough root cause analyses. A well-defined Industrial Internet and analytics strategy will help isolate and address HSE issues.

RFID based automation in manufacturing industry





Block Diagram of IoT

IV.IOT ADOPTION BARRIERS

Lack of interoperability and unclear value propositions

Despite a shared belief in the potential of IoT, industry leaders and consumers are facing barriers to adopt IoT technology more widely. "Instead of convincing consumers that they need complex systems to serve needs they don't have, we should fix real problems people struggle with every day." Many gadgets in the consumer IoT space have appealed to early adopters, yet failed to demonstrate relevance to ordinary people's lives."In order to boost sales and drive demand beyond the early adopter set, we need to stop making toys no one cares about and instead work on building simple solutions to real, everyday problems for real people."

A recent study by Ericsson regarding the adoption of IoT among Danish companies, has suggested that many are struggling "to pinpoint exactly where the value of IoT lies for them". A company must identify where the value of IoT lies in order to capture it, otherwise non-action is the consequence.This indicates that a major roadblock to IoT adoption is not technical but analytical in nature.

Privacy and security concerns

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V. CONCLUSION

Nowadays we need everything computerized. Earlier we can only monitor the situations with the help of cameras. In industries to reduce manual overhead we have implemented Internet of Things (IoT) in Industry to monitor as well as to inform the responsible person to take appropriate measures, but this will partially fulfil our requirement. As sometimes it will be late in this process and it will harm to property as well as life.We hope that in near future using IoT we can nearly control every automation and will be even more evolved and useful than it is at present.

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23

INDUSTRIAL AUTOAMTION USING INTERNET OF THINGS (IOT)

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ABSTRACT:

In this paper we have presented present status of industrial automation using IOT. The internet of things is a network of physical object that contain embedded technology essence communicate with extrinsic environment. The industrial internet of thing is part of internet of thing that focuses on devices and object used in business setting. The vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors, and embedded systems. No ways to detect un-even condition. Manual intervention required for monitoring. CCTV used which only monitor but no Alert generation. It helps to connect everything around you to internet including wearable devices, metering devices and environmental sensor. This paper summarizes the current applications and implementation of IOT in automation industry. In future we hope that IOTs will further enhance and make a revolution in industry and also in home appliances.

Keywords:Automation,IOT, sensors,Artificial intelligence, Embedded electronics.

I.

I. Introduction:

Industrial Internet of Things (IoT) is the best way of connecting industrial machineries and sensors, to each other, over the internet, allowing the authorized user of the industry to use information from these connected devices to process the obtained data in a useful way. IoT-connected applications typically support data acquisition, aggregation, analysis, and visualization. The IoT architecture includes latest technologies such as computers, intelligent devices, wired and wireless communication and cloud computing. Previously Bluetooth and RF (Radio Frequency) technologies were used to control and monitor the industrial applications but were limited to short distance. The operator had to be in the range of the Bluetooth connectivity or in the Radio Frequency area .Solution to the short

distance communication is the IoT based industry automation. Here we can have controlling as well as monitoring from anywhere in the world.

Model Example of Industrial Automation

II.History:

First time automation in industries was done through the use of steam and water power. As the advancement took place, electricity was introduced and was used in industries for mass production. The term Internet of Things is 16 years old. But the actual idea of connected devices had been around longer, at least since the 70s. Back then, the idea was often called "embedded internet" or "pervasive computing". But the actual term "Internet of Things" was coined by Kevin Ashton in 1999 during his work at Procter&Gamble. Ashton who was working in supply chain optimization, wanted to attract senior management's attention to a new exciting technology called RFID. Because the internet was the hottest new trend in 1999 and because it somehow made sense, he called his presentation "Internet of Things". Even though Kevin grabbed the interest of some P&G executives, the term Internet of Things did not get widespread attention for the next 10 years.

III.Current Technology:

When computers were invented, it was designed to perform multiple functions. As time went on, computers became cheaper and then almost all industries started using it for automation because it reduced a major work load experienced by the humans and still it is considered as the best option to control and monitor a application. Automation is done through the technologies such as Bluetooth and radio frequency which can be employed for short distance communication.

The following six use cases are examples of how manufacturers are putting IIoT to smart business use:

1. **Rapid Costing:** In many industries, manufacturing functions are considered as internal suppliers to the product management group or the sales team and, therefore, must provide cost estimates during tendering and business developmentcycles. Tough market dynamics require rapid costing on price indications about a particular piece of equipment, and this quick turnaround can be a decisive factor in whether the enterprise wins or loses major orders. Historical data including hit-rates, customer preferences, footprint requirements, past tendering records, executed projects and product definitions must be combined in an IIoT strategy to inform tendering feedback, reduce lead time and increase quality of tendering.

2. **Non-Conformance Report (NCR) Analytics**: Manufacturing organizations usually collect data points regarding non-conforming events that arise on the factory floor. An NCR is issued when a product, process or procedure does not comply with set standards. It can also represent a significant deficiency. An NCR is generally used as a tool to reduce errors as much as possible and keep faulty products and equipment from reaching customers. IIOT technologies can help analyze NCR data, find relationships between NCRs and support the prediction of future non-conformances.

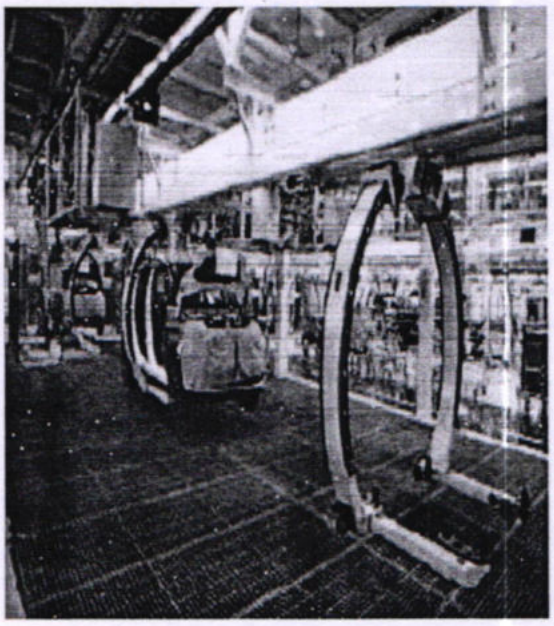
3. **Plant Load Optimization:** Sales and Operations Planning (S&OP) processes are the core of a manufacturing company. They allow management not only to get a handle on the business but also to create a command and control system that integrates strategic business plans and tactical day-to-day operations. S&OP helps guide daily operations and monthly plans toward long-term business goals and aligns manufacturing, suppliers and customers. Depending on the product's lifecycle, the S&OP process can define the load forecast over time, which helps determine which products an enterprise will manufacture at which plant—and creates the basis for plant loading. This decision has implications on operational and financial performance. Historical load, industrial footprint, executed projects, scope changes and customer behavior are data points that can optimize plant loading. To understand and balance the trade-offs to optimize loading requires an IIoT strategy.

4. **Shop Floor Operational Improvements:** Manufacturers are increasingly interested in the use of low-cost sensors attached to machines for preventive maintenance and condition-based monitoring. Some are finding wireless connectivity and big data processing tools can make it cheaper and easier to collect actual performance data and monitor equipment health. For example, critical machine tools are designed to operate within certain temperature and vibration ranges. Sensors that can actively monitor and send an alert when the tool deviates from these prescribed parameters can aid in preventing malfunctions. When critical equipment fails, operations can quickly fall behind and miss on-time delivery, leading to delayed projects and cost overruns. Big data in an IIoT solution can help improve overall equipment effectiveness (OEE), minimize equipment failure and enable proactive maintenance to reduce or eliminate downtime.

5. **Suppliers and Supply Chain**: Access to real-time supply chain information helps identify issues before they happen, reduces inventory and potentially reduces capital requirements. The IIoT can help manufacturers gain a better understanding of this information. By connecting plants to suppliers, all parties involved in the supply chain can trace interdependencies, material flow and manufacturing cycle times. IIoT-enabled systems can be configured for location tracking, remote monitoring of inventory and reporting of parts and products as they move through the supply chain. They can also collect and feed delivery information into ERP, PLM and other systems.

6. **Health, Safety and Environment:** Key Performance Indicators (KPIs) for health, safety and environment (HSE) include data for injury and illness rates, short- and long-term absences, near-misses, vehicle incidents and property damage or loss during daily operations. These measurements are typically stored in myriad systems, spreadsheets and emails and are reported sporadically during management reviews or audits. Lagging indicators do not have any relational value and companies rarely perform thorough root cause analyses. A well-defined Industrial Internet and analytics strategy will help isolate and address HSE issues.

RFID based automation in manufacturing industry



Lack of interoperability and unclear value propositions

Despite a shared belief in the potential of IoT, industry leaders and consumers are facing barriers to adopt IoT technology more widely. "Instead of convincing consumers that they need complex systems to serve needs they don't have, we should fix real problems people struggle with every day." Many gadgets in the consumer IoT space have appealed to early adopters, yet failed to demonstrate relevance to ordinary people's lives. "In order to boost sales and drive demand beyond the early adopter set, we need to stop making toys no one cares about and instead work on building simple solutions to real, everyday problems for real people."

A recent study by Ericsson regarding the adoption of IoT among Danish companies, has suggested that many are struggling "to pinpoint exactly where the value of IoT lies for them". A company must identify where the value of IoT lies in order to capture it, otherwise non-action is the consequence. This indicates that a major roadblock to IoT adoption is not technical but analytical in nature.

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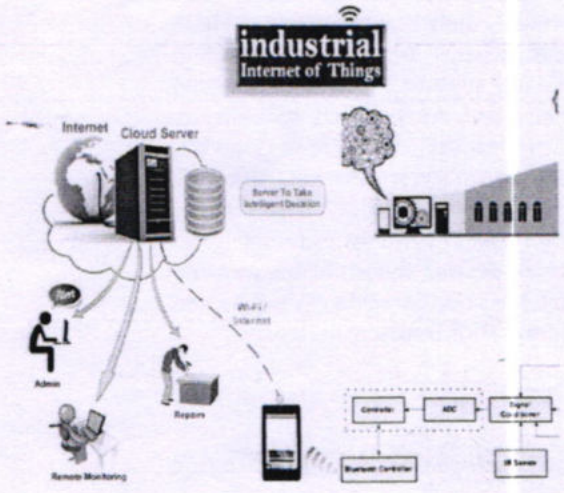

Block Diagram of IoT

IV.IoT adoption barriers

simply won't happen. "In a post-Snowden world of global surveillance disclosures, consumers take a more active interest in protecting their privacy and demand IoT devices to be screened for potential security vulnerabilities and privacy violations before purchasing them. According to the 2016 Accenture Digital Consumer Survey, in which 28000 consumers in 28 countries were polled on their use of consumer technology, security "has moved from being a nagging problem to a top barrier as consumers are now choosing to abandon IoT devices and services over security concerns ."The survey revealed that "out of the consumers aware of hacker attacks and owning or planning to own IoT devices in the next five years, 18 percent decided to terminate the use of the services and related services until they get safety guarantees.

Conclusion:

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Fuzzy and De-Coupled *d-q* Control Strategy in Riven Bias Inverter for Islanding Operation in Microgrid

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Riven Bias Inverter with is de-coupled control structure is important in controlling the power on AC side and DC Side Independently. The use of linguistic variable approach in riven bias inverter (RBI) integrated on to the microgrid makes the control structure mode digitalized. Hence the work shown here gives the analysis of fuzzy integrated with decoupled *d-q* control strategy in riven bias inverter to attain digitalized independent control for islanding operation in microgrid. RBI is a combination of boost and VSI on a single unit. The proposed work Simulates fuzzy integrated with the mathematical modeling of de-coupled *d-q* control along with modulation switching technique. The modulation pattern is used with synchronous reference frame control procedure to acquire the decoupled control structure in riven bias inverter. The work is investigated in MATLAB/SIMULINK.

Keywords: Riven Bias Inverter (RBI), Linguistic Variable, Fuzzy, De-Coupled *d-q* Control.

RESEARCH ARTICLE

1. INTRODUCTION

The research on integration of boost converter on front phase followed by inverter as two stage architecture.[1–4] Also decoupled *d-q* control structure is implemented in SSI to have an independent control towards AC side and DC Side. References [5–6] proposed impedance and determinant based GNC approach. But still can't be avoided for stability analysis in case complex AC systems. References [7–9] proposed a linear controller based I-PD controller focused the analysis towards non-linear dynamics. The non-linear dynamics is transformed to *d-q* system analysis to make the linear controller design easy. Reference [10] proposed frequency regulation technique in microgrid by implementing fuzzy PI controller and the proposed concept is compared with the conventional method of fly wheel energy storage system (FESS) which is constantly faced with change in power and operating point. Reference [11] focused the research towards the fuzzy logic controller that alters the bus frequency and this frequency is used by the local controllers of the parallel unit to manage the power generated by Opto-electric source or to supplement the power from auxiliary unit. Also fuzzy technique is proposed in supervisory control unit to guarantee that the battery power and energy not exceeding the designed maximum limit. References [12–14] provide comparative analysis between MPCC and IMPCC. The proposed IMPCC eliminate the current error of current control system and also less sensitive to system parameter variations. Reference [15] proposed adaptive fuzzy PI controller and non-linear time domain simulation to improve the dynamic performance of autonomous microgrid during disturbances. Reference [16] focused on to the analysis of the main issues that occur in microgrid. The issue of power stability based on energy storage system (ESS) is solved by designing the controller based on load un-certainty. A comparative analysis is furnished between the conventional and proposed controller under sudden load changes and fault occurrences. Reference [17] proposed a technique that eliminates the adverse effect of grid current by higher order harmonics. Reference [18] focused the analysis towards the Adaptive TSK-type Neural Fuzzy Controller (ATNC) in DC–DC converter. The DC–DC converter finds ever-growing application in Communication Systems. In this the membership function is tuned and optimized by calculating the error between the output voltage of the converter and its reference parameter. Reference [9] focused on to the analysis of active-reactive power control using decoupled control strategy and fuzzy techniques. The fuzzy rule is used to design the gain of PI controller.

2. PROPOSED WORK AND ITS SIMULATION TEST RESULTS

2.1. Active Power and Voltage Control Method in RBI

The designed control structure has two loops cascaded with each other. The inner loop is a current control loop of

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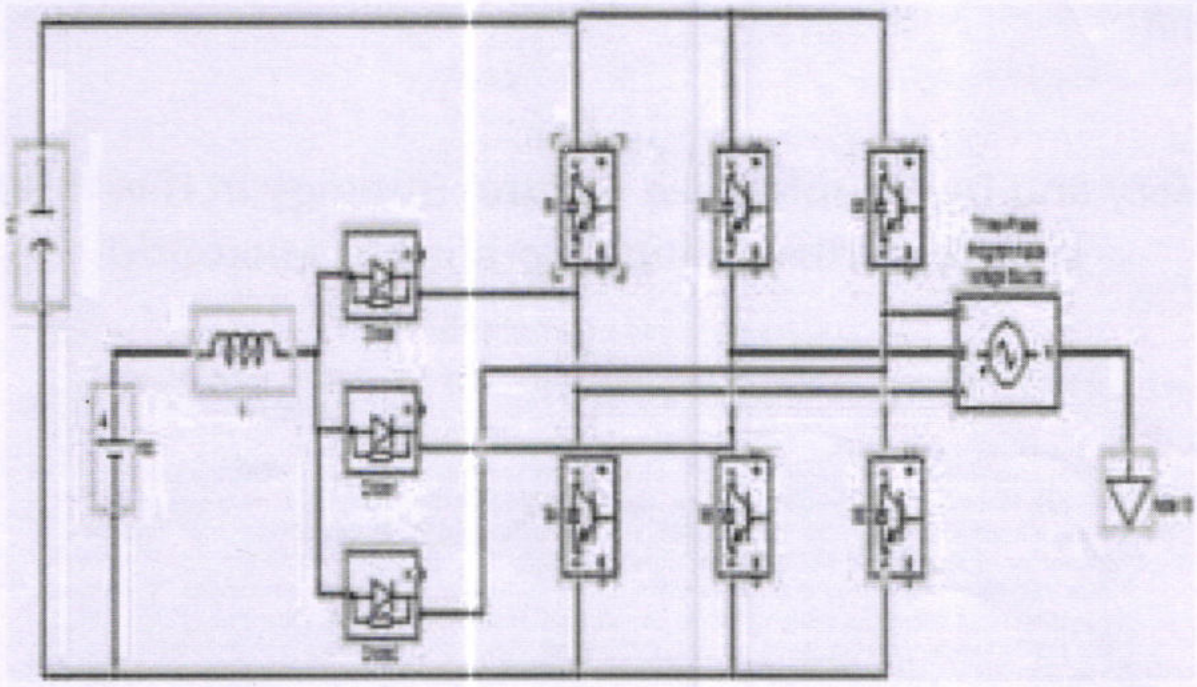

Fig. 1. 3-Ø riven bias inverter.

RBI which independently controls the d-q component of riven bias inverter output current in synchronously rotating frame. The outer control loop regulates the power and voltage magnitude of riven bias inverter.

A Riven bias inverter interfaced with distributed energy source in Figure 1.

The d-q Current control for riven bias inverter is simulated as shown in Figure 2. Obtained in d-q synchronous rotating frame and are as shown in Eqs. (1) and (2) in Figure 3.

$$V_d = s_d V_{dc} + \omega L i_q - R i_q - L\frac{di_d}{dt} \quad (1)$$

$$V_q = s_q V_{dc} + \omega L i_d - R i_d - L\frac{di_q}{dt} \quad (2)$$

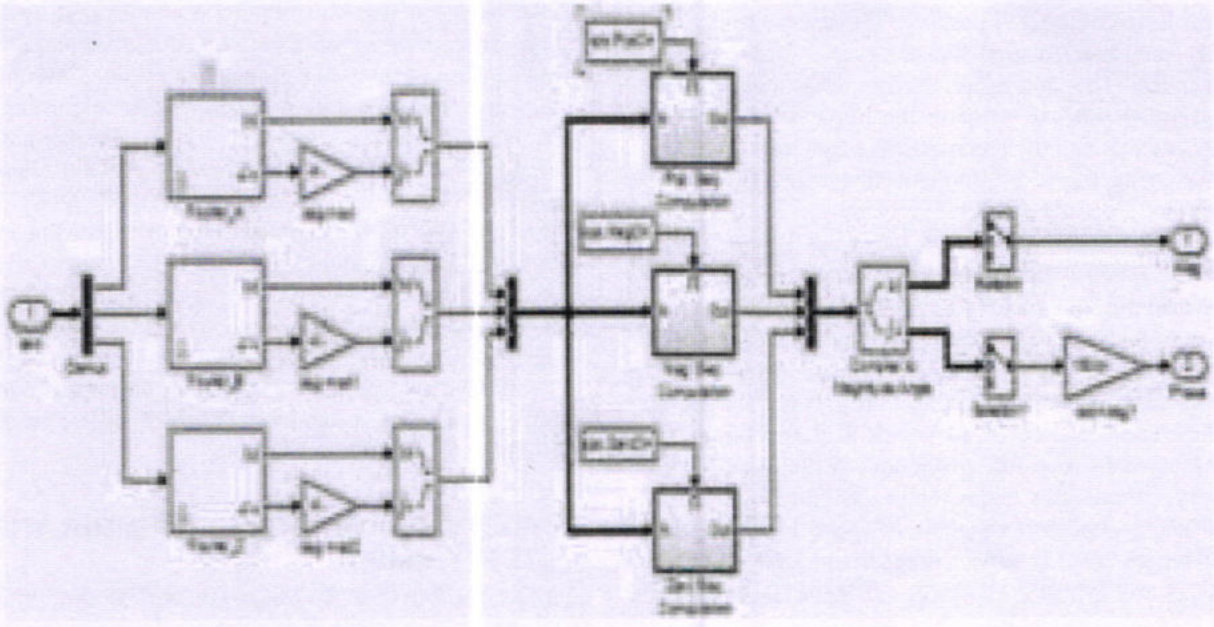

Fig. 2. Simulation diagram of three phase d-q current control.

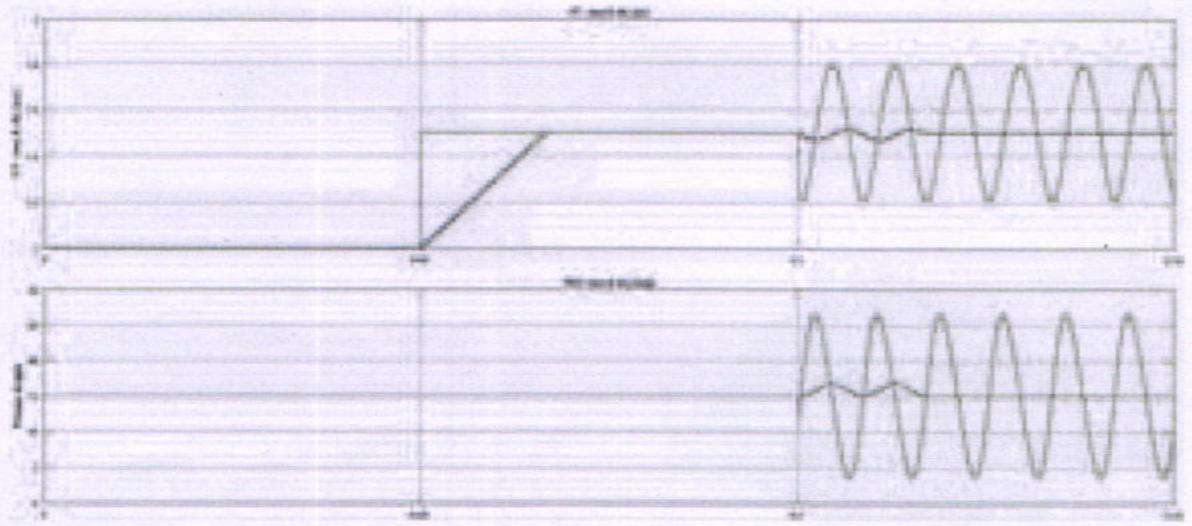

Fig. 3. Output of *d-q* current control.

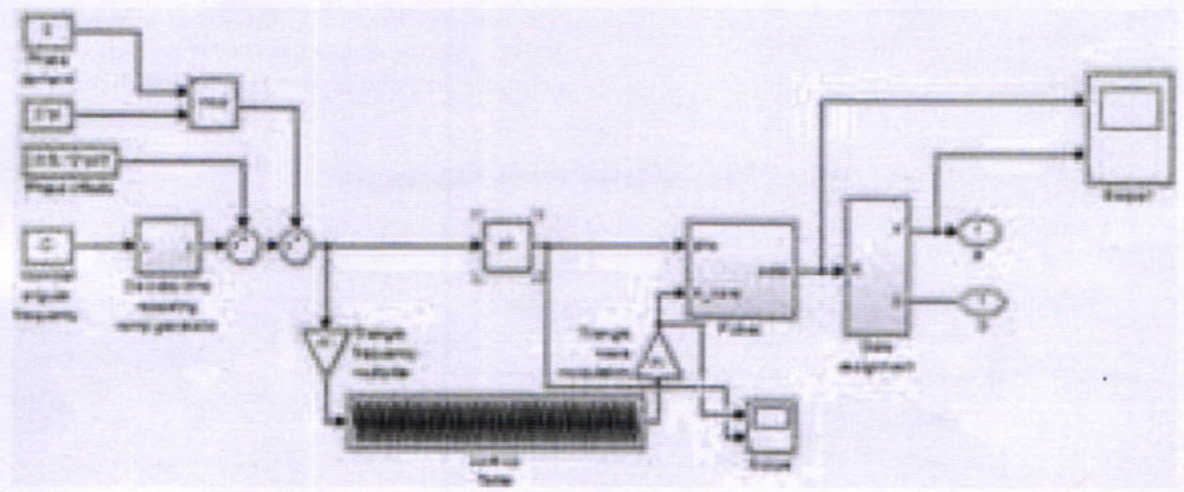

Fig. 4. DSVM simulation diagram.

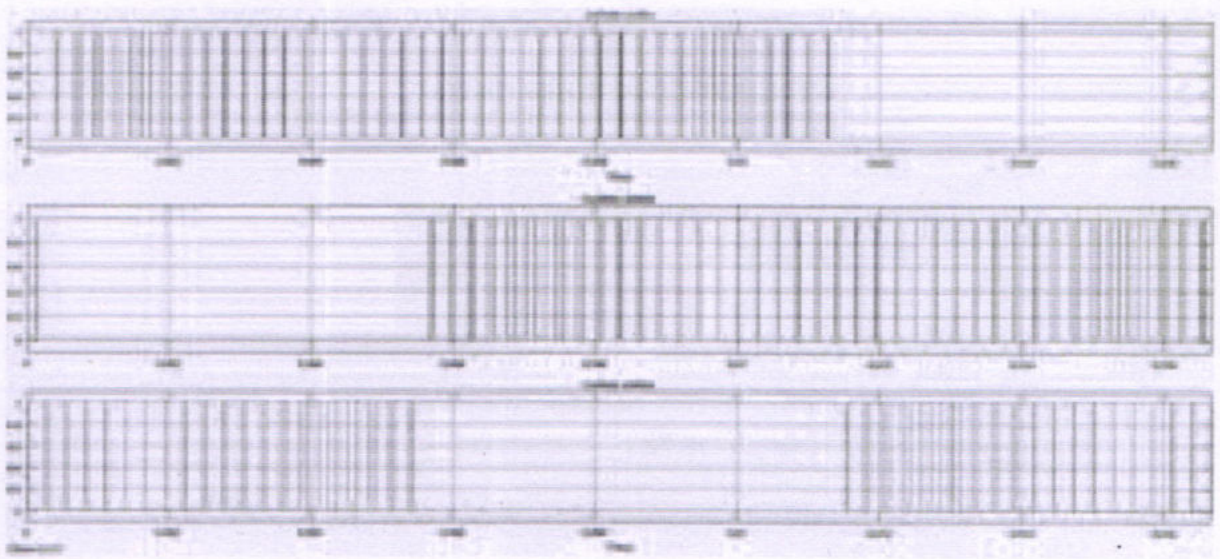

Fig. 5. DSVM pulse output.

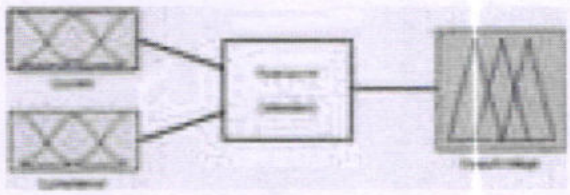

Fig. 6. Fuzzy logic controller.

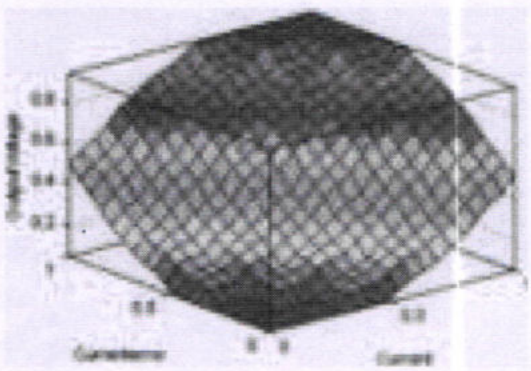

Fig. 7. Control surface for current compensation.

The d-q vector representation is given in Eqs. (3) and (4)

$$s_d V_{dc} = Ri_d + L\frac{di_d}{dt} - \omega Li_q + V_s \tag{3}$$

$$s_q V_{dc} = Ri_q + L\frac{di_q}{dt} + \omega Li_d \tag{4}$$

I_d and i_q in Eqs. (3) and (4) are cross coupling terms of s_d and s_q

$$V_{1d} = (k_{idp} + k_{idi}/s)(i_d^* - i_d) - \omega Li_q + V_s \tag{5}$$

$$V_{1q} = (k_{iqp} + k_{iqi}/s)(i_q^* - i_q) + \omega Li_d \tag{6}$$

2.2. DSVM Modulation

For the proposed riven bias inverter DSVM modulation technique is used which is one of the digital modulations. The DSVM modulation technique produces a pulse of 8 states (i.e.,) 000, 001, 010, 011, 100, 101, 110, 111. The designed Riven Bias inverter is switched in all the 8 states and the simulation DSVM as shown in Figure 4 generates the pulse as shown in Figures 5 and 6.

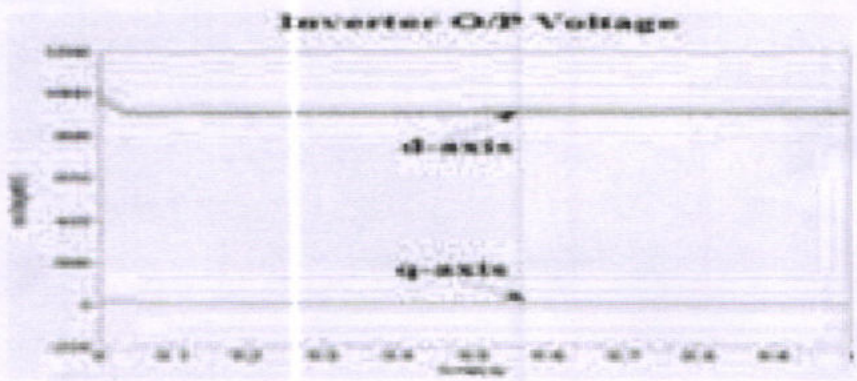

Fig. 8. Riven bias inverter output voltage.

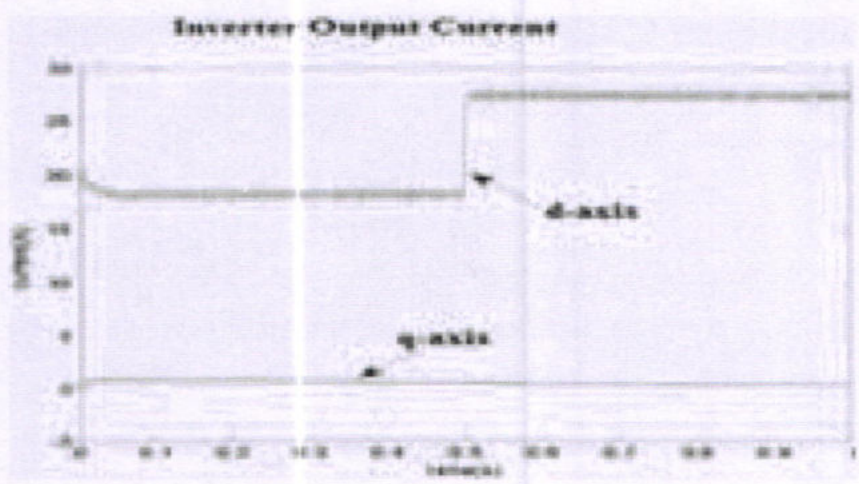

Fig. 9. Riven bias inverter output current.

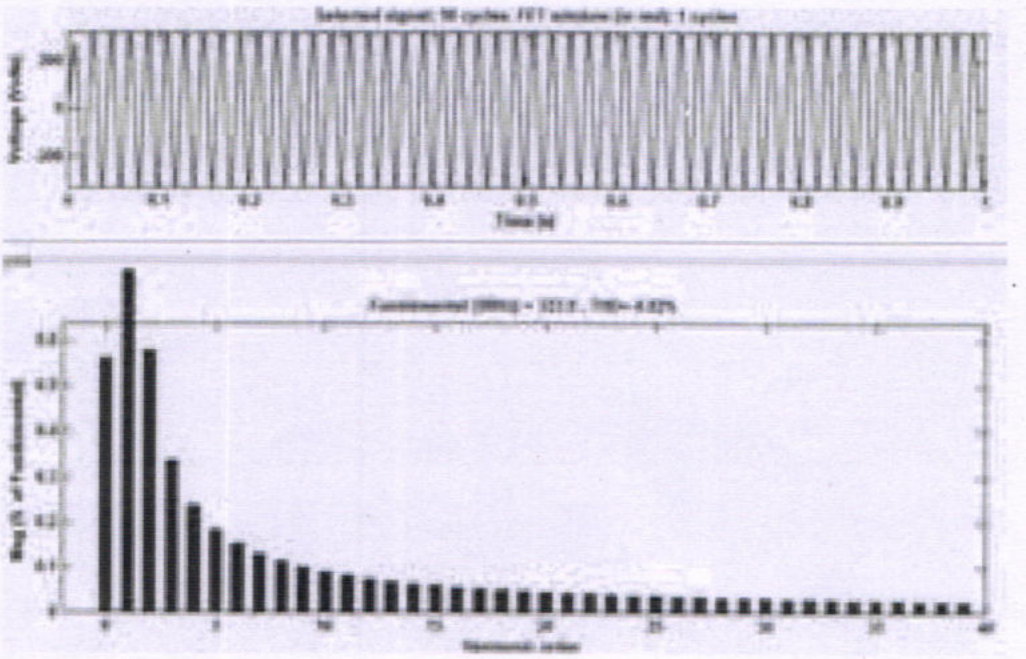

Fig. 10. THD analysis of riven bias inverter.

2.3. Fuzzy Control for Current Compensation

On succeed the negative viewpoints about DSVM conventional controller, fuzzy based DSVM controller is executed Riven Bias Inverter interconnected with grid (Fig. 10). The use of fuzzy in Riven Bias Inverter along with modulation produces current error and is used at the feedback of the *d-q* controller to have a fuzzy and decoupled *d-q* control in microgrid inverter.

3. CONCLUSION

In this paper closed loop control of riven bias inverter in grid connected operating mode was discussed in islanding mode with the introduced novel fuzzy and decoupled *d-q* control strategies to have an independent control for many applications. The designed control scheme for RBI is a combination of DSVM, fuzzy current compensation technique and synchronous reference frame control technique. With the implementation of the above control structure in RBI interconnected with microgrid capable of active-reactive power control in grid, voltage and current compensation on both DC side and AC Side. The load resistance reduced to 50% of the rated values at 0.5 s. The simulation results are shown as below. It is clear from Figure 7 the *d*-axis or *q*-axis voltage of the RBI output remains unchanging from 0 s to 1 s. It can be seen in Figure 8 that inverter output current steps at 0.5 s according to the variation in load and then becomes stable. Figure 9 shows the THD present in the system is 0.82% for an inverter voltage of 323 V at its rated frequency 50 Hz.

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Future of Cloud Computing In It Field 2020

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Abstract: **- Many organizations taking their first tentative steps, but by 2020 cloud is going to be a major and permanent part of the enterprise computing infrastructure. Three years from now we are likely to see low power processor crunching many workloads in the cloud and supporting massively federated scalable software architecture.2020 cloud computing is likely to be a standard part of enterprise IT. To get an idea of the type of failures that cloud companies will be forced to deal with. It is helpful to look to supercomputing an area that uses many of the technologies and methods that eventually makes the way into the cloud.**

Key Words- **Cloud Computing Architecture, Hosting a cloud, Cisco.**

I. INTRODUCTION

Simply put, cloud computing is the delivery of computing services—servers, storage, databases, networking, software, analytics and more—over the Internet ("the cloud"). Companies offering these computing services are called cloud providers and typically charge for cloud computing services based on usage, similar to how you are billed for water or electricity at home.

The first cloud computing services are barely a decade old, but already a variety of organizations —from tiny startups to global corporations, government agencies to non-profits—are embracing the technology for all sorts of reasons. Here are a few of the thing you can do with the cloud:

- Create new apps and services
- Store, back up and recover data
- Host websites and blogs
- Stream audio and video
- Deliver software on demand
- Analyze data for patterns and make predictions

Cloud computing has been referred to as revolutionary, even magical. Like most trends in IT, cloud computing is a combination of a number of underlying trends that have long been in the works, a kind of evolutionary blend of our previous successes and failures. A key term driving the adoption of cloud computing has been the term "the cloud." In essence the concept of "the cloud" is as a metaphor for the Internet as an operational environment where applications are utilized over the Internet rather than through more traditional means such as a desktop Virtualization was the evolutionary missing link, one that gave computational resources a new found manageability and efficiency. For the first time "Virtual machines" would be able to not only scale horizontally (more resources added as needed) but vertically, whereby clones of application components could be replicated at will. This newfound freedom opened a world of possibilities. Freed from the constraints of the previous client/server models of the past, a new breed of service providers rose to take advantage of this flexibility. The rest of the paper is organized as follows. We present the literature survey, proposed model in section 2 and section 3 respectively, the proposed mechanism and the current state of this research. Lately, Conclusions and references are presented in section 4 and section 5.

II. LITERATURE SURVEY

Cloud Computing Architecture:

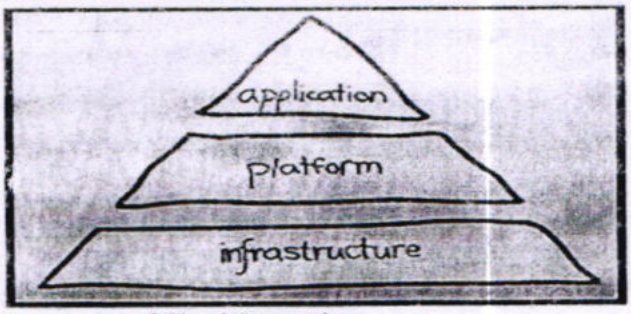
Cloud computing architecture refers to the components and sub components required for cloud computing. These components typically refer to:

- Front end(fat client, thin client)
- Back end platforms(servers, storage)
- Cloud based delivery and a network (Internet, Intranet, Inter cloud).

Hosting a cloud:

There are three layers in cloud computing. Companies use these layers based on the service they provide.

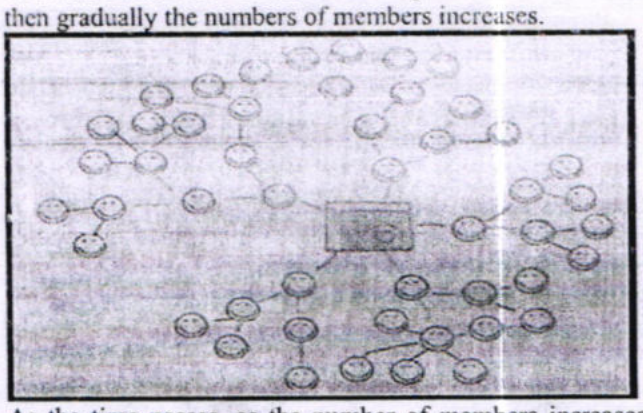
- Infrastructure
- Platform
- Application



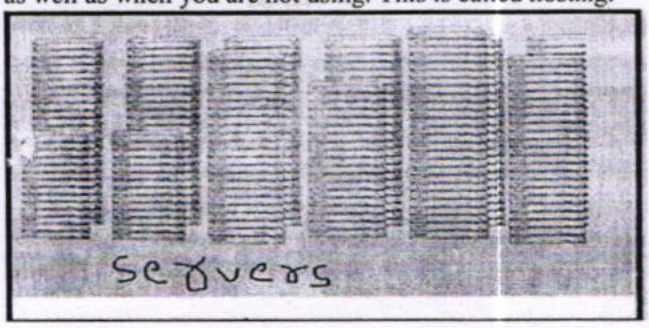
Three layers of Cloud Computing

At the bottom is the foundation, the Infrastructure where the people start and begin to build. This is the layer where the cloud hosting lives.

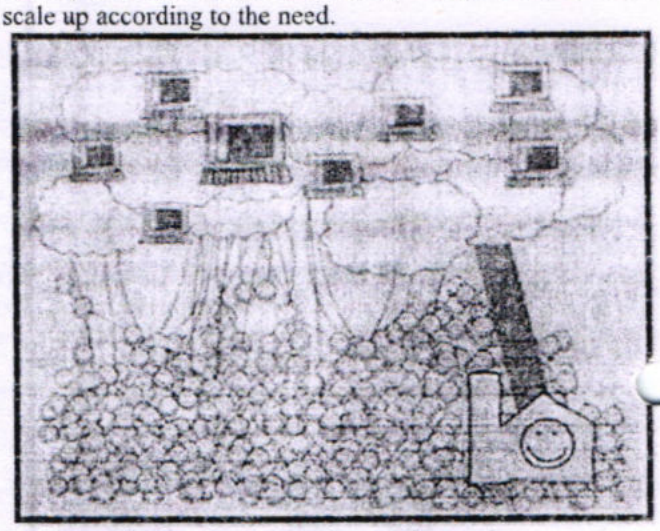
Now, let's have a look at hosting: Let's say you have a company and a website and the website has a lot of communications that are exchanged between members. You start with a few members talking with each other and then gradually the numbers of members increases.



As the time passes, as the number of members increases, there would be more traffic on the network and your server will get slow down. This would cause a problem. A few years ago, the websites are put in the server somewhere, in this way you have to run around or buy and set number of servers. It costs a lot of money and takes lot of time. You pay for these servers when you are using and as well as when you are not using. This is called hosting.



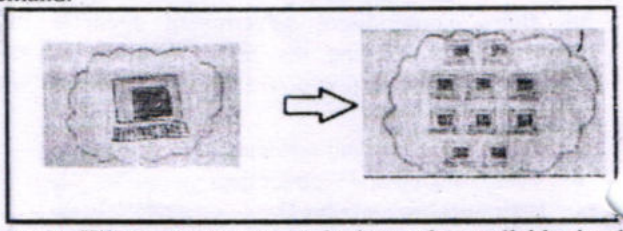
This problem is overcome by cloud hosting. With Cloud Computing, you have access to computing power when you needed. Now, your website is put in the cloud server as you put it on dedicated server. People start visiting your website and if you suddenly need more computing power, you would scale up according to the need.



Scaling up in the cloud according to the need

Benefits of Cloud Hosting:

Scalability: With Cloud hosting, it is easy to grow and shrink the number and size of servers based on the need. This is done by either increasing or decreasing the resources in the cloud. This ability to alter plans due to fluctuation in business size and needs is a superb benefit of cloud computing especially when experiencing a sudden growth in demand.



Instant: Whatever you want is instantly available in the cloud.

Save Money: An advantage of cloud computing is the reduction in hardware cost. Instead of purchasing in-house equipment, hardware needs are left to the vendor. For companies that are growing rapidly, new hardware can be a large, expensive, and inconvenience. Cloud computing alleviates these issues because resources can be acquired quickly and easily. Even better, the cost of repairing or replacing equipment is passed to the vendors. Along with purchase cost, off-site hardware cuts internal power costs and saves space. Large data centers can take up precious office space and produce a large amount of heat.

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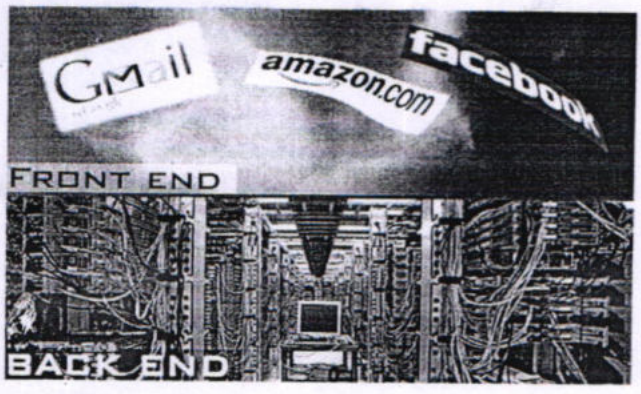
Moving to cloud applications or storage can help maximize space and significantly cut energy expenditures.

Reliability: Rather than being hosted on one single instances of a physical server, hosting is delivered on a virtual partition which draws its resource, such as disk space, from an extensive network of underlying physical servers. If one server goes offline it will have no effect on availability, as the virtual servers will continue to pull resource from the remaining network of servers.

Physical Security: The underlying physical servers are still housed within data centers and so benefit from the security measures that those facilities implement to prevent people accessing or disrupting them on-site

III. FEATURE OF CLOUD COMPUTING

To understand how does cloud computing work, imagine that the cloud consists of layers — mostly the back-end layers and the front-end or user-end layers. The front-end layers are the ones you see and interact with. When you access your email on Gmail for example, you are using software running on the front-end of a cloud. The same is true when you access your Face book account. The back-end consists of the hardware and the software architecture that fuels the interface you see on the frontend. Cloud computing also allows for a lot of flexibility. Depending on the demand, you can increase how much of the cloud resources you use without the need for assigning specific hardware for the job, or just reduce the amount of resources assigned to you when they are not necessary.



Even it will change the way of using the computer

The transition from being very 'personal hardware dependent' to a world where resources are shared among the masses is creeping up on us slowly and unobtrusively. Very many people have already transitioned to using a cloud environment for most of their time in front of the computer without even realizing it. The possibility of being able to access your data and software wherever you need it makes this transition very appealing to most people.

Are there problems with this concept? Of course there are. If for some reason your internet goes down, your access to your data also disappears. There are security concerns with the data and the risk that companies will use proprietary formats for the files and that require that you pay for a certain service monthly or you may lose access to your own data permanently. Even Cloud Computing will play a major role in IT field.

The IT Infrastructure will be crucially changed, as more applications are being moved to private or public clouds. Software developers will have to adjust the ways they create and deliver applications.

The need for IT support staff is reduced, thus diminishing the cost with desktop support. However, a new need is created, which is training the employees to work with and understand the new systems and applications.

The effort to maintain the data is also diminished. However, moving the data to the cloud equates losing its physical control, as it is stored in the vendor's data center. Although clients might not be comfortable with this fact, they should understand that data in the cloud can be safer than being in-house. This brings us to our next point.

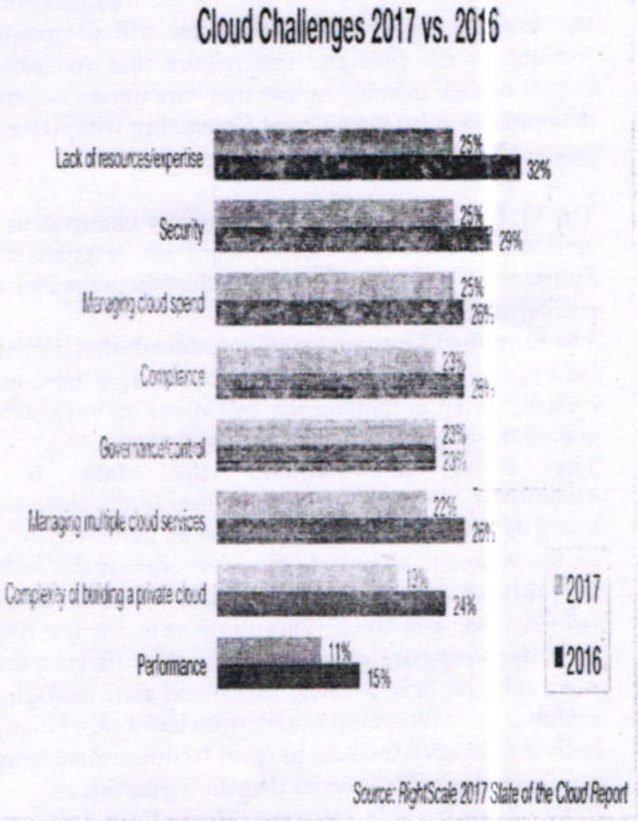
Security: Enterprise cloud providers that offer a managed cloud solution have security experts on staff managing the applications, with security options included. A best-practice method is to store the data in more facilities to make sure it is safe. I believe this is better than do-it-yourself.

Highly customizable software: Most of the software that companies use is not "cloud-ready". This is where the software developers intervene, by creating code especially designed for the cloud. Also, cloud providers should make their best in making this transition easy. However, once the applications are SaaS, the need for the IT department troubleshooting decreases.

Small and large organizations are utilizing the cloud to deliver responsive IT and innovate how they do business. At Micro Strategies, we assess your specific business demands and use our understanding of the cloud to design a customized, end-to-end, cloud strategy that will help you achieve your revenue and growth goals. Our dedicated team and comprehensive list of cloud services and offerings will make sure your personalized cloud solution helps you exceed expectations while providing maximum value.

Every cloud implementation demands its own unique needs and challenges. Through our strategic partnerships we have the ability to build a solution based on IBM's Soft Layer or Microsoft's Azure, so we can provide Public, Private, and

Hybrid combinations that ensure your business can take advantage of a cloud solution that moves you forward effectively and efficiently.



IV. CONCLUSION

In this paper, how cloud will appear in future the most organizations irrespective of size are already looking at the cloud as the first option. In next few years the predictions are mid-boggling Cisco. The latest market analysis by Cisco shows that within next three years more than four-fifths of all data center traffic, 83 percent, will be based in the cloud. Wherein most of this will be going to public cloud services, thus there will be more workloads (56 percent) in the public cloud than in private clouds (44 percent).

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RESEARCH ARTICLE

Energy Efficiency Improvement in Renewable Distribution System (RDS) Synchronized with Riven Bias Inverter and Reactive Power Control

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In the Renewable Distribution System it is essential to improve the efficacy as the Opto-electric Source tends to have more losses. The reduction in losses due to Opto-electric Source is a challenging factor. The proposed paper focuses on the concept of reducing the losses in Renewable Distribution System (RDS) to improve the Energy-efficacy. The losses in RDS involve Control of Conversion losses, transfer losses and control of (IRP) and (CRP). The Conversion loss in RDS includes Solar panel, Battery and inverter. The conversion loss in Solar panel is avoided by means of modified extreme power tracker (EPT) and by using Riven Bias Inverter synchronized with reactive power control. The proposed solution for the problem defied can be achieved by implementing EPT on Solar Side, RBI synchronized with reactive power control. The projected work inspects the impact of RDS VAR Control on loss reduction improvement and voltage defilement correction. The performance of the proposed work is simulated and the results are verified in MATLAB/SIMULINK.

Keywords: Renewable Distribution System (RDS), Extreme Power Tracker (EPT), Energy Efficacy, Loss Reduction, Inductive-Reactive Power (IRP), Capacitive-Reactive Power (CRP), VAR, Voltage Defilement Correction.

1. INTRODUCTION

Energy Crisis in India has become a common problem in India. Increasing universal energy demand and augmented consciousness of the consequences of climate change have put renewable energy in the spotlight. Renewable energy generation using Opto-Electric (OE) Source is incessantly increasing in several countries. The power output of a Opto-Electric (OE) plant depends on climatological conditions. In areas subjected to vigorous weather changes, it is characterized by high erraticism and low short-term expectedness. These physiognomies challenge power system machinists, since they familiarize un-certainties in numerous functions of power system management, especially in large-scale PV integration.

Chenhui Lin et al.[1] deals with the concept of integration of multifaceted distributed generation systems with respect to voltage problems. The researcher of this paper focused his work towards decentralized responsive power optimization in multifaceted transmission and Distribution network using generalized Benders decomposition (GBD) to improve the efficacy. Fang Yang et al.[2] focused on Distributed Management system to improve the energy efficiency in Distribution System. The proposed work in this paper deals with the advanced loss reduction technique to attain optimal power control among numerous capacitors and DER's. The concert of the solution demonstrates the competence of on-line solution for large and multifaceted distribution network. Ahmed Abdelhakim et al.[3] projected an extension of dual SSI to triple SSI and its performance is validated by using two carrier signals of triangular wave and saw-tooth wave. After validating the performance of dual SSI and triple SSI architecture is compared with reference to voltage stress, availability of harmonics at its output. Ahmed Abdelhakim et al.[4] introduced a novel modulation technique RMSV modulation. The control scheme used in this closed loop SSI is developed with the combination of RMSV and Synchronous reference frame control technique. The developed closed-loop control scheme of SSI operating in grid connected operating mode addresses a decoupled control structure which controls the parameter both on DC section and AC Section. The introduced control structure is tested under different transient conditions. Bifaretti et al.[5] Proposed predictive dead beat control for 4 leg inverter. The dead beat control

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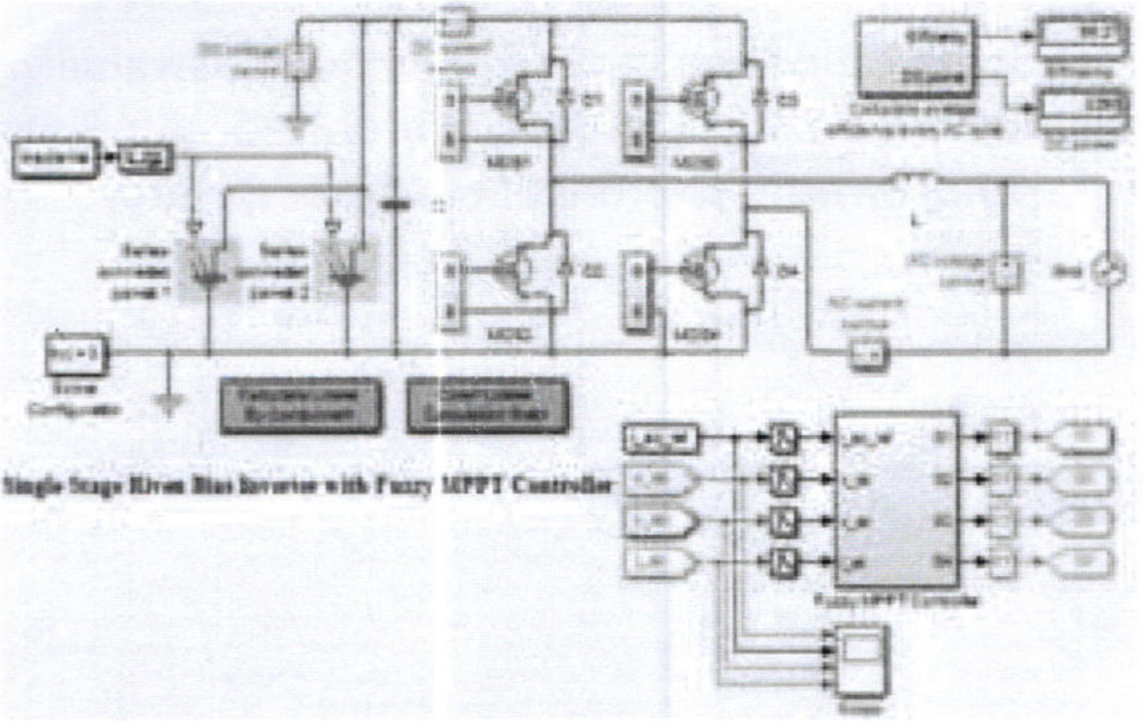

Fig. 1. Single stage riven bias inverter with fuzzy MPPT controller.

is compared with the classical PI controller and resonant controller and proved that no tuning is required in the control loop. Predictive dead beat control is applicable only for balanced and linear loads. For an unbalanced and non-linear load separate harmonic compensation circuit is required.

Ahmed Abdelhakim et al.[6] deals with the theoretical analysis of integration of 2-level SSI in a 3-level Diode clamped inverter in which phase disposition based SVPWM is used. The theoretical analysis concludes with lower current stress and higher voltage stress. Martins et al.[7] focuses on integration of distributed energy sources and distribution network evolving Active Distribution Network. Chenhui Lin et al.[8] proposed de-centralized reactive power optimization after integrating transmission and distribution system. The integral of transmission and distribution system is revised through generalized Benders decomposition along with SCOP relaxation technique. Over-voltage in integral system is reduced and power optimization with state estimation is test for the system IEEE 9-bus transmission system and IEEE 33-bus distributed network. Cheng-Yan Chuang et al.[9] proposed type-2 fuzzy based MPPT controller to track maximum power and to prevent noise interference. The proposed type-2 fuzzy based MPPT algorithm experimental output produces 99.07% and is higher than fuzzy incremental conductance algorithm. Jyri Kivimak et al.[10] deal with the MPPT algorithm for the non-linear voltage–current characteristics. The experimental idea is implemented with decreased-order transfer functions for the converters armed with any of I-type or PID controllers' in-order to approximate the extreme sampling or perturbation frequency for MPPT algorithm. Aryal et al.[11] uses fuzzy logic algorithm in residential grid connected Opto-electric inverter. The fuzzy algorithm avoids the problem of tracking fluctuations encountered with other type of MPPT techniques in Figure 1.

2. PROPOSED CONCEPT

The Proposed work determines the efficacy of single stage Riven Bias Inverter (RBI). As a first step the complete model is simulated in MATLAB/SIMULINK for a comprehensive AC cycle with a definite Solar Irradiance and corresponding optimum DC voltage and RMS value of AC Current. After simulation the optimum value of DC voltage is determined as 342 V and RMS value of AC

Table I. Loss in components of RBI with MPPT controller.

Logging node	Power
'elec_Riven_Bias Inverter.D1'	0.91116
'elec_Riven_Bias Inverter.MOS1'	15.478
'elec_Riven_Bias Inverter.MOS2'	21.807
'elec_Riven_Bias Inverter.MOS3'	15.965
'elec_Riven_Bias Inverter.MOS4'	21.783
'elec_Riven_Bias Inverter.D2'	3.4972
'elec_Riven_Bias Inverter.D3'	0.88853
'elec_Riven_Bias Inverter.D4'	3.4629

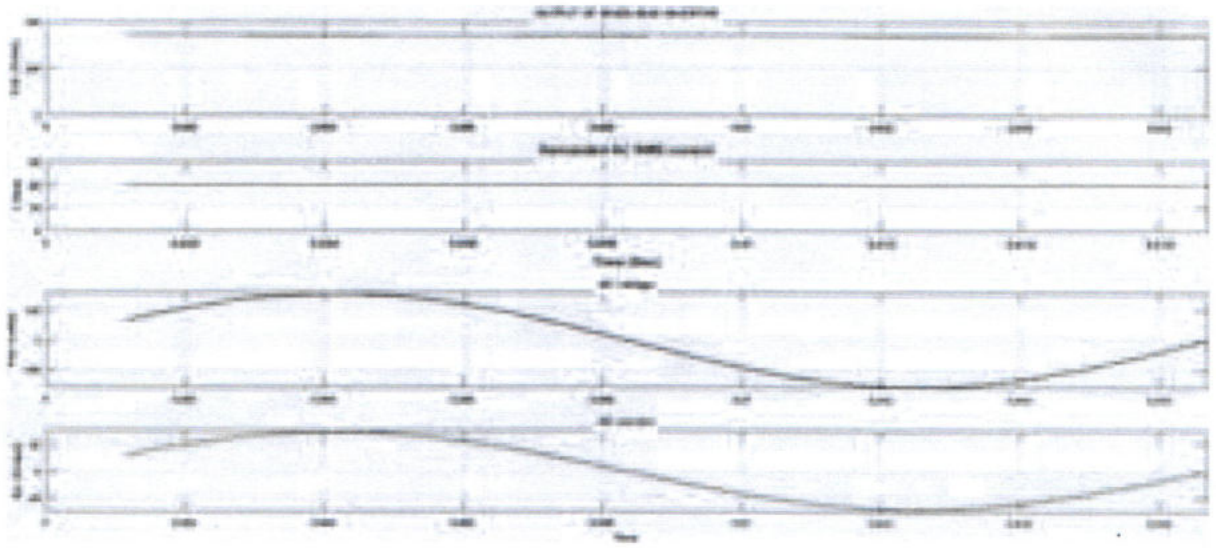

Fig. 2. Single stage riven bias inverter.

Table II. P_{mpp} @ different irradiance and temperature.

P_{mpp} @ 1000 W/m^2, 25 deg = 100.7 kW @ 273.5 V
P_{mpp} @ 250 W/m^2, 25 deg = 24.4 kW @ 265.1 V
P_{mpp} @ 1000 W/m^2, 50 deg = 92.9 kW @ 250.2 V
P_{mpp} @ 1000 W/m^2, 0 deg = 107.5 kW @ 296.6 V

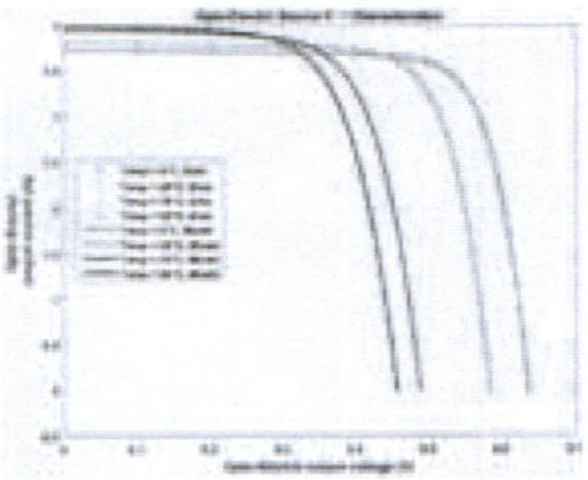

Fig. 3. Opto-electric source V–I characteristics @ different temperature.

Current is 20.05 Amps for an irradiance of 1000 W/m^2 and a panel temperature of 20 °C.

The losses across various nodes on inverter section are tabulated as shown in Table I. The losses are recorded in Riven Bias Inverter implemented with MPPT Controller. The Riven Bias Inverter implemented with MPPT Controller produces an efficiency of 85% where 15% is recorded as conversion loss. On detecting the losses at various nodes on inverter an effective fuzzy based Extreme Power Track (EPT) Controller is designed to increase the efficiency up to 96.35%.

3. SIMULATION TEST RESULTS

3.1. Stage-1

The solar panel is tested for its V–I characteristics at different temperature levels and is plotted in Figure 2.

3.2. Stage-2

In Stage-2 Fuzzy based Extreme Power Track (EPT) Controller is designed along with PI and PD Controller and its performance is tested to track its maximum power and the status of maximum power tracked and the result is shown in Table II with Figure 3.

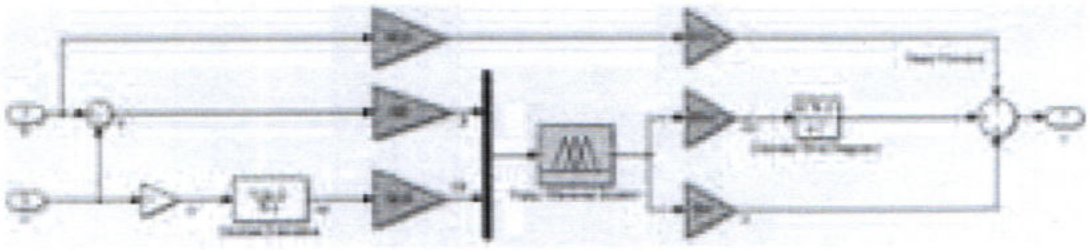

Fig. 4. Fuzzy EPT controller.

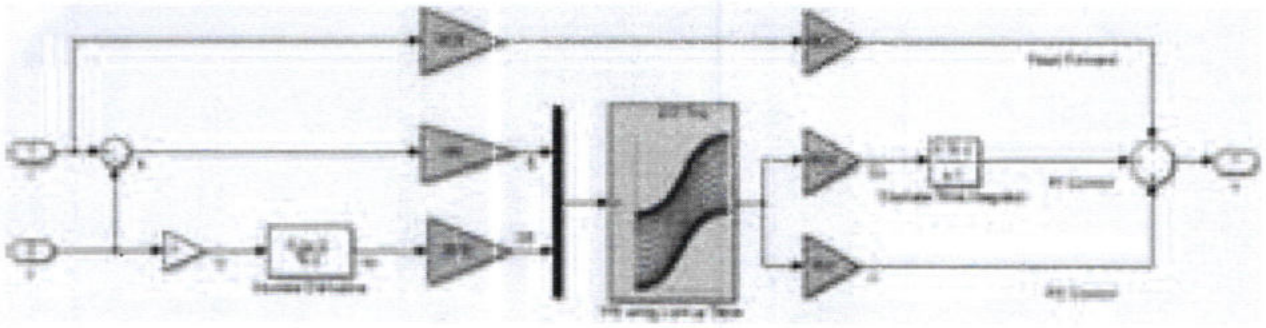

Fig. 5. Fuzzy EPT controller using look up table.

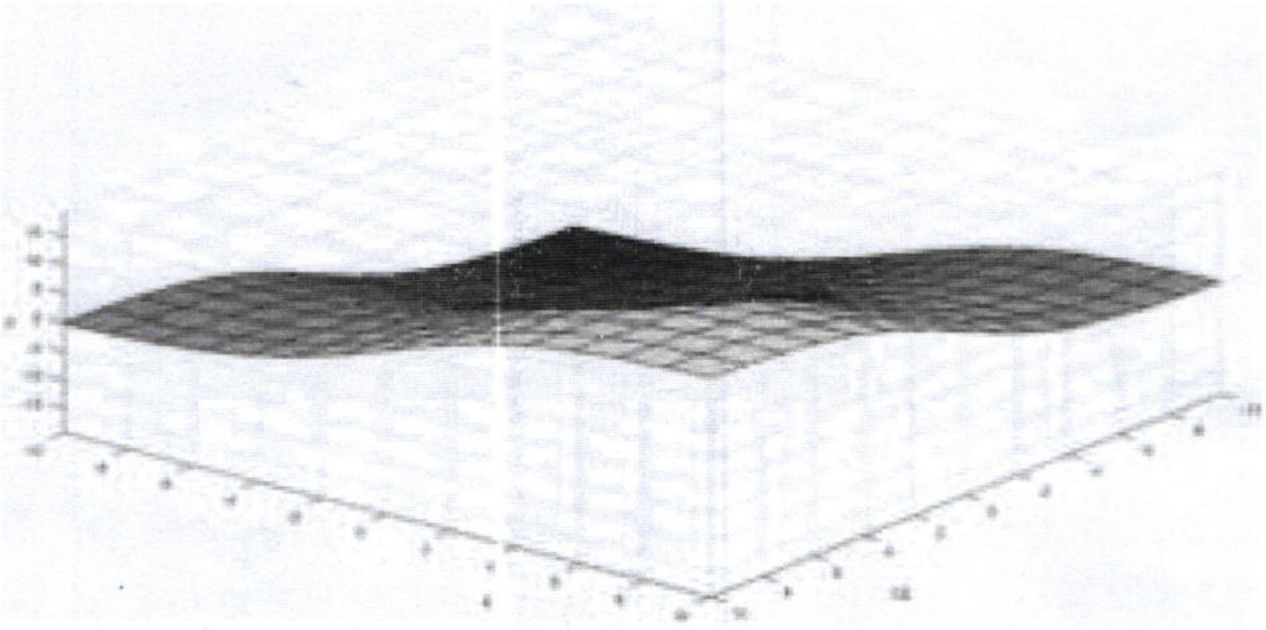

Fig. 6. Fuzzy analysis for non-linear panel surface—3D output.

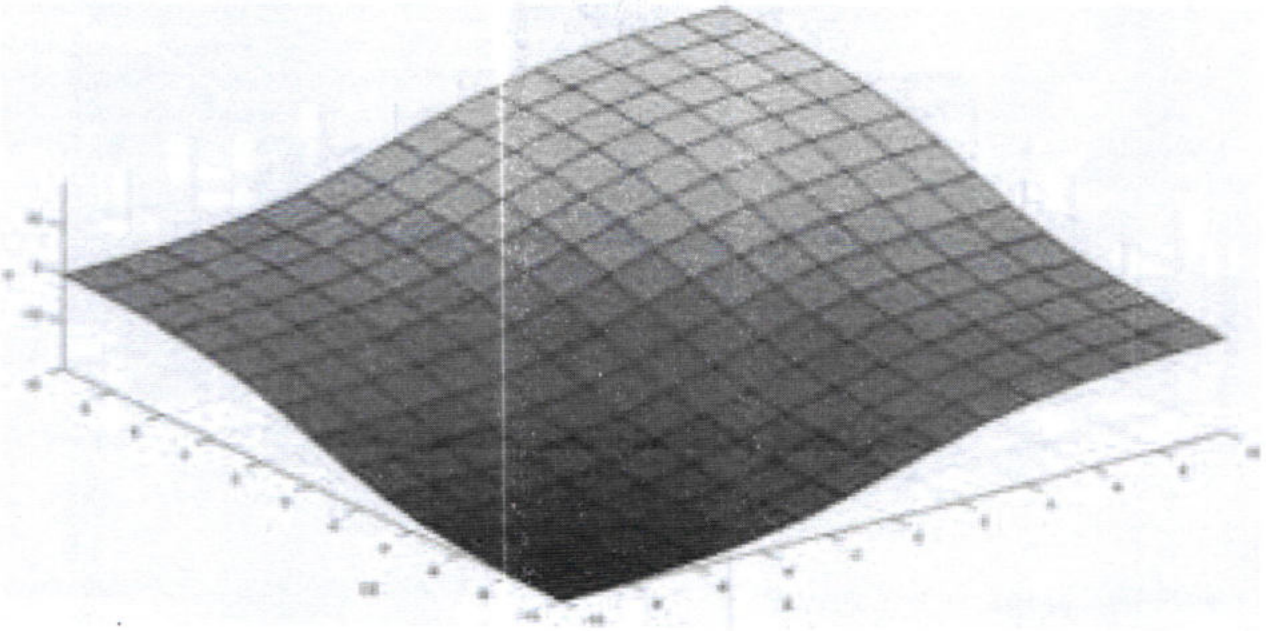

Fig. 7. Fuzzy analysis for linear panel surface—3D output.

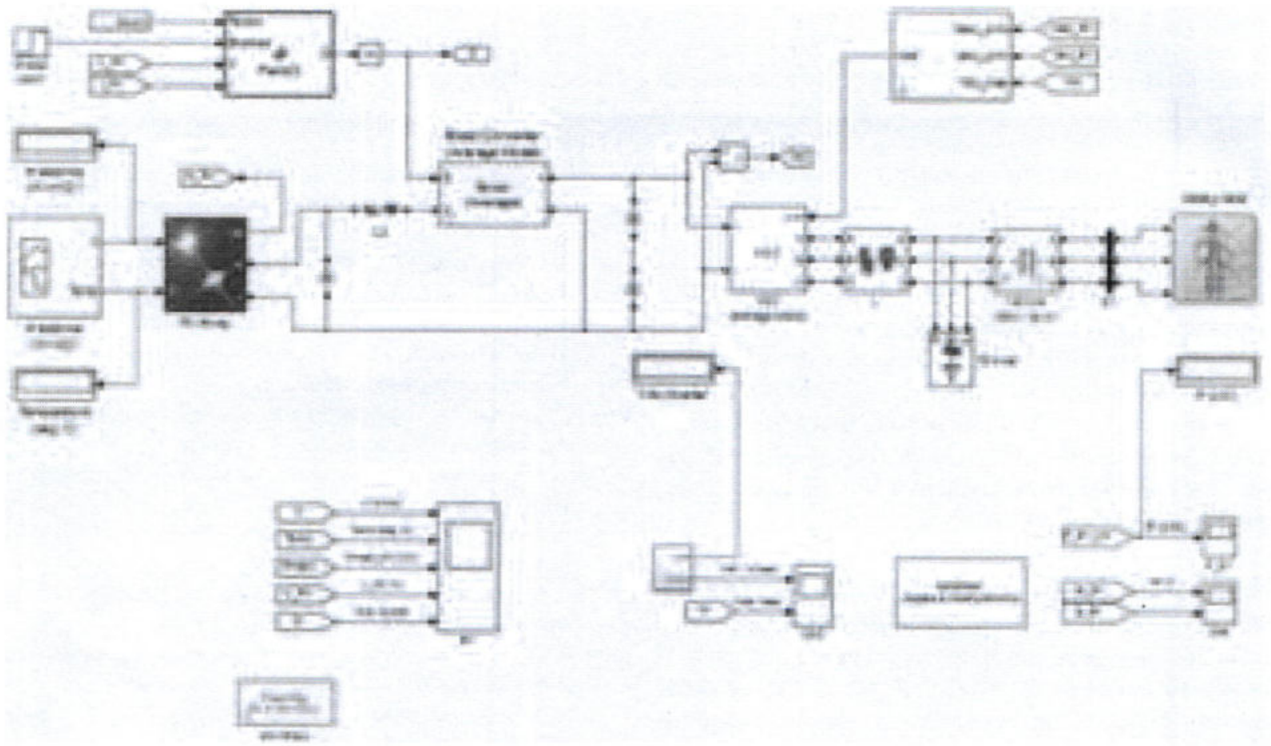

Fig. 8. Simulation diagram of 100 KW grid connected riven bias inverter.

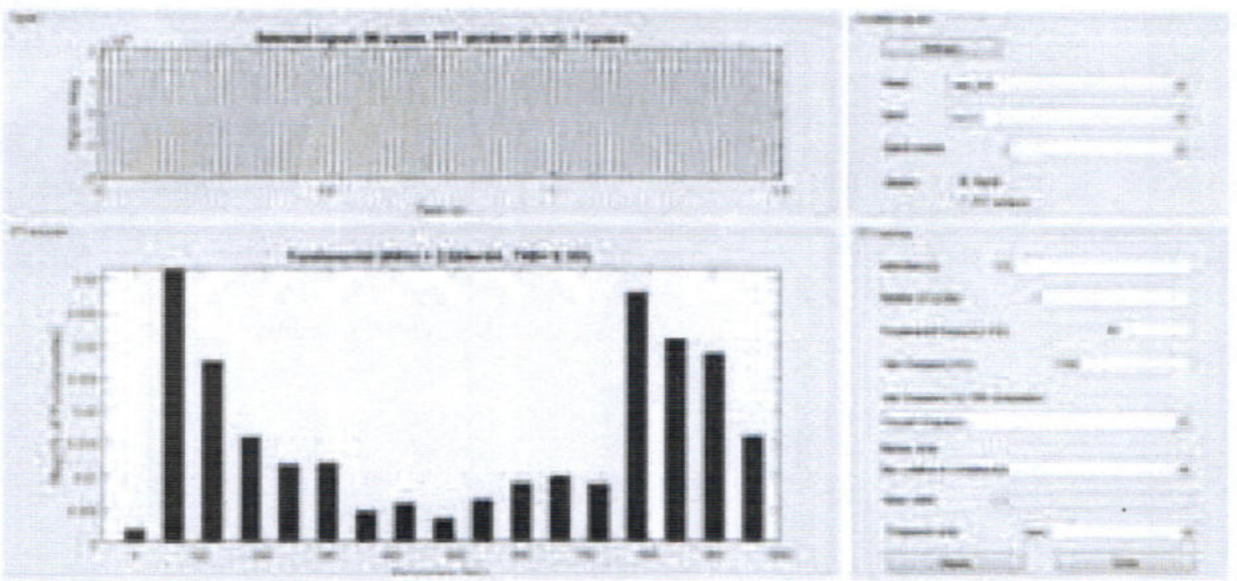

Fig. 9. THD analysis of 100 KW grid connected riven bias inverter.

Table III. Fuzzy EPT algorithm validation against time domain simulation.

Sl. no	Irradiance (W/m^2)	Temperature (°C)	Riven bias inverter input (V)	P_{mpp} KW (KW)	Riven bias output (V)	P_{out} KW	Energy efficiency (%)	Losses
1	1000	25	273.5	100.7	445	98	97.3	3.4
2	250	25	265.1	24.4	445	21.96	90	2.44
3	1000	50	250.2	92.9	445	88	94.7	4.9
4	1000	0	296.6	107.5	445	104	96.7	3.5

With the effective design of fuzzy EPT controller it is possible to achieve efficient output in non-linear surface. This is achieved by adjusting the fuzzy inference system in Figure 8.

3.3. Stage-3

The tested solar array along with Fuzzy Extreme power Tracker is implemented in Simulation for the Riven Bias Inverter (RBI).

Figure 9 shows the THD Analysis of Simulated 100 KW grid Connected Riven Bias Inverter and is observed that the total distortion harmonic is 0.1% at full load and 60 Hz frequency.

4. CONCLUSION

The proposed work presents an efficient and robust loss reduction technique in renewable Distribution System (RDS) to improve the energy efficiency. The proposed work is modeled with Fuzzy Extreme Power Tracker on Solar Section, Riven Bias Inverter with DSVM technique. The Complete set-up is integrated with 100 KW grid and simulated in MATLAB/SIMULINK. The Fuzzy EPT Algorithm Endorsement against Time Domain Simulation is tabulated in Table III and it is observed that the reduction in losses is approximated to 5 KW and the Energy efficiency is improved to 97.3%. With the implementation of Fuzzy Extreme Power Tracker on Solar Section, Riven Bias Inverter with DSVM technique, the loss percentage is reduced to 2.7%. The total distortion harmonic observed is 0.1% at full load and 60 Hz frequency.

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Electronic Healthcare Consultation System (E-Consults)

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Abstract:- **One of the main issues in the modern society is maintaining health and so we make it modernized and self-usable for all people. The aim of this project is to bring healthcare to people in need. People in rural areas can use this system to connect to internet from a centre and answer some questions to get some medical advice and keep their health record clean. If it is minor it suggests medicines or also gives doctor contacts. E health care is a new trend that recently comes in to use with the availability of new electronic and software applications. We are developing a web-based healthcare system in order reach every single person who is in need. A Few software users in this are Java, PHP and MySQL. A brief description of this system, a patient in need logs in through an Id they create. Then the person has to answer a series of questions related to health. The system gathers all the answers, analyses and manipulates and gives a most appropriate answer. It either gives a health issue according to it the person could go ahead or if it thinks it's more of a serious issue it gives contacts of doctors related to it. This system also holds all the records of that particular logged in patient's account.**

Keywords--- **E health, Modernized, Self-Usable.**

I. INTRODUCTION

Electronic consultations (e-consults) are a promising approach to the challenge of improving access to specialty care. E-consults offer a rapid, direct, and documented communication pathway for consultation between primary care and specialist. They may avert the need for a face-to-face visit between specialist and patient. As a result, they have the potential to enable cost-effective and convenient care for patients while improving access to and coordination of specialty care across the system. As such, they may offer an appealing new modality for rational appropriation of health care services. We define an e-consult as an asynchronous communication between healthcare providers that occurs within a shared electronic health record (EHR) or secure Web-based platform. Referring providers send a consultation request to specialists, who can respond by answering the consult question, requesting more information, and/or scheduling a specialist appointment. The concept of using provider-to-provider communication to precede, enhance, or replace specialty visits is not new. "Curbside" consultations are common, and telemedicine modalities such as email and videoconferencing are increasingly used, but each has limitations. Curbside consults are informal, undocumented communications which do not imply specialist review of data and require synchronous communication. Email consultations are asynchronous, but are not integrated into the EHR and do not require data review. Videoconferencing between providers requires specialized equipment and synchronous communication. E-consults address many of these limitations; they formalize the consultant role, occur within a secure and dedicated platform, and do not require individuals to be present simultaneously. E-consults have been adopted at an increasing number of US academic centers, private health care settings, and in the Veterans Affairs health care system, as well as internationally, but research on their use and impact lags behind the enthusiasm for their implementation.

USES FOR E-CONSULTS:

E-consults are used for a variety of purposes, both within and across medical centers. The most commonly described use of e-consults is by PCPs to request clinical input from specialists on outpatient issues. Hematology and endocrinology are consistently among the top five specialties receiving these e-consults across systems. There are multiple examples of e-consults being adapted for other tasks. North et al. identified 7 alternative types of e-consults at the Mayo Clinic. After primary care-to-specialty e-consults (44%), inter-specialty (30%) surgical (8.7%), and intra-specialty (7.5%) e-consults were most common. One of

the less common types was the required e-consult for certain clinical situations (2.7%). For example, the transplant service at Mayo Clinic required a psychiatric review via e-consult of potential transplant patients' self-administrated psychological evaluations.

Specialty services can develop condition-specific e-consult programs. One endocrinology service encourages providers at their VAMC and affiliated clinics to refer all patients with a hemoglobin A1C > 9% or evidence of hypoglycemia for a team-based diabetes e-consult. At Mayo, an elevated ambulatory blood pressure monitor reading can trigger a hypertension e-consult to nephrology. Specialty services may also unilaterally initiate e-consults without a PCP request. For example, a group of 3 VAMCs in North Carolina used regional clinical data to identify patients with an osteoporotic fracture for automatic e-consults to a bone specialist for secondary prevention.

E-CONSULTS' EFFECT ON WORKFLOW:

For the PCP, placing an e-consult is generally easy and convenient. Receiving the specialist's response, however, generates additional work that may have fallen to the specialist in the case of a face-to-face visit. In a simulation model, the PCP's ability to follow up on e-consult recommendations in a timely manner was influenced by covering for another PCP, the number of walk-in patients daily, the number of other electronic notifications received daily, and number of e-consults completed by specialists. Specialists may also experience increased work. In a VA report, specialists estimated that 27% of e-consults represented new work, i.e., consultations that would not have occurred formally or informally in the absence of e-consults. The time to complete an e-consult is usually less than 15 minutes, but could be much longer.

The e-consult platform impacts usability. In settings where providers do not share an EHR, logging on to a separate system may be slowed by insufficient equipment availability, spotty internet connections, or the need for multiple log-ins. With a shared EHR, although more patient data is readily available for the responding provider, pinpointing the relevant information from years of accumulated notes and test results can be challenging. The e-consult request may be templated to help support the consult question, but templates may be inadequately completed or not meet the needs of the requesting provider.

FUTURE RESEARCH DIRECTIONS:

Based on the state of the e-consult literature, we recommend five major directions for future research; studies of: 1) implementation;
2) appropriate use;
3) communication;
4) effectiveness; and
5) unanticipated consequences.

Implementation studies

Evaluative research on both new and more mature e-consult programs should explore facilitators and barriers to use of e-consults, including training and support requirements, usability, impact on workflow, and effect on provider communication. These factors are not well-described in the literature but are highly likely to impact provider efficiency and adoption.

Appropriate use

Achieving coordinated, high-quality and efficient care depends in part on providing the level of specialty input that matches needs of the patient and PCP. E-consults are but one modality for delivery of specialty care. As such, they may be more or less appropriate for certain specialties, clinical conditions, or patient types. A better understanding of patient complexity and preferences, and PCP, specialist and system factors in relation to e-consultation is needed.

Communication

Effective provider-provider communication is at the heart of e-consultation and strategies are needed to optimize it. For example, specialists can best respond to an e-consult when the provided data is sufficient, accurate, and usable. Further explorations of the use of templates or service agreements that specify details of bidirectional information exchange are needed.

Effectiveness

For policymakers and organizational leaders, the most pressing questions are about whether the reduced burden to patients and faster access to specialists translate to better outcomes. There are opportunities to rigorously evaluate the effect of e-consults on health care utilization, clinical endpoints, waiting times for specialty clinic appointments, and cost. Better metrics are needed for clinical outcomes and access, which have thus far been measured by primarily by provider perceptions rather than objective criteria.

Unanticipated consequences

Every change in health care delivery carries the likelihood of both positive and negative unintended consequences. For example, e-consults may increase PCP knowledge and skills; a positive impact. On the other hand, e-consults are used to solicit specialty advice for patients who may never be seen by the specialist, perhaps raising safety or satisfaction concerns; a negative impact. This issue has not been addressed in studies to date, but researchers should be open to recognizing such effects as e-consults evolve and their use expands.

Limitations

Most published studies originate from one of three integrated health care systems, so the generalizability of their findings is limited. By restricting our systematic evaluation to peer-reviewed literature we may have inadvertently overlooked additional publications of interest. We may have excluded relevant manuscripts in languages other than English. Nonetheless, to our knowledge the only review of e-consults was published in 2011, and that was not a systematic review. Considerable growth of e-consults has occurred since that time, necessitating our systematic review.

Patient benefits

- Increased satisfaction
- Improved continuity of care
- Improved access to specialty care
- Improved patient care
- Timeliness of results

II. CONCLUSION

An e-consult program could alleviate pressure on limited health system resources by improving access to specialty care at relatively low cost. There are multiple opportunities to investigate the benefits and costs of different e-consult models, which may encourage adaptation of payment strategies to cover e-consults in fee-for-service or accountable care organizations. This idea of paper is to eliminate corporate pricing and provide cheap healthcare to the needy just using the almighty web.

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Cyber Security: Computer Viruses

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Abstract:- **Computer virus refers to a program which damages computer systems and destroys or erases data files. It has the capability to copy itself and infect a computer without the permission or knowledge of the owner. The different types of computer viruses are Trojan Horse, Boot Sector Virus, DOS Virus, Worm, Time Bomb and Logical Bomb. Viruses can be spread through email and text message attachments, Internet file downloads, social media scam links, and even your mobile devices and smartphones can become infected with mobile viruses through shady App downloads. Viruses can hide disguised as attachments of socially shareable content such as funny images, greeting cards, or audio and video files. The most common symptoms of computer viruses are Your computer slows down without any reason. Your computer system has less available memory than it should, Unknown programs or files are being created, Programs or files become missing, Corrupted files, your computer restarts in unusual ways. Some files or programs suddenly don't work properly, Strange messages, displays, music or sounds, Changed Hard Drive name or Volume name, Hard Drives or Disk Drives are inaccessible.**

Keywords: **What is virus, Type of viruses, Latest Computer viruses, Overcoming the Threats, Well Known Anti-viruses.**

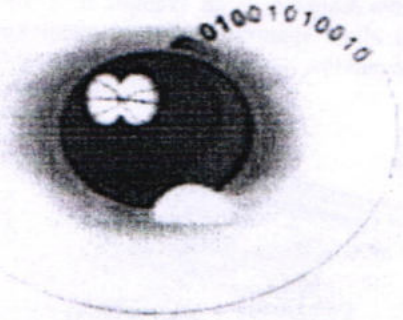
I. INTRODUCTION (WHAT IS COMPUTER VIRUS)

A computer virus, much like a flu virus, is designed to spread from host to host and has the ability to replicate itself. Similarly, in the same way that viruses cannot reproduce without a host cell, computer viruses cannot reproduce and spread without programming such as a file or document. In more technical terms, a computer virus is a type of malicious code or program written to alter the way a computer operates and that is designed to spread from one computer to another. A virus operates by inserting or attaching itself to a legitimate program or document that supports macros in order to execute its code. In the process a virus has the potential to cause unexpected or damaging effects, such as harming the system software by corrupting or destroying data.

II. TYPES OF COMPUTER VIRUS

A. Time Bomb

A time bomb is a virus program that performs an activity on a particular date It is a piece of Programming Code designed to damage a computer system at some point in the future. Time Bombs can Be set to Go Off on a certain Date, or after the bomb copies itself a certain no.of times. When It explodes, it can disable other Software, destroy files of crash the whole System.



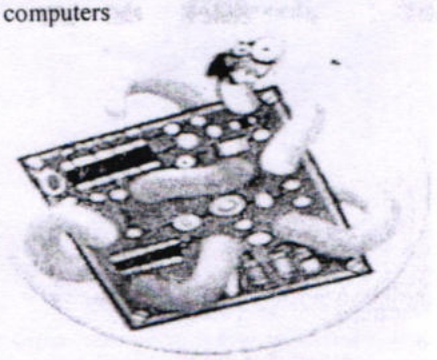
B. Logical Bomb

A logic bomb is a sort of program or you can say a part of some program which let itself dormant till a certain logic program is activated. A logic bomb is very comparable to a land mine. Most of a time an activation key for a logic bomb, is a date. The logic bomb keeps checking the system for date and remains in position till the set time is reached. As soon as time has been reached it activates itself. Logic bomb lacks the power to replicate itself so it is an easy task to write a logic bomb. And it would also don't spread to unintended systems. It is a sort of civilized program threat.

The classic use of this virus is ensuring payment for some software. if you don't pay for some software then it is certain that embedded logic bomb would be activated and deletes that software from your system. And if more malicious then it would result other data deleting from your system.

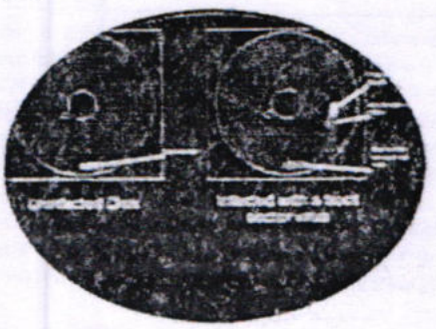
C. Worm

It is a code designed to damage a wide network of Computers. A common purpose of worms is to install a backdoor into a computer. These are programs that allow others to gain access to your computer. Worms Spread by digging into the e- Mail address book and sending themselves automatically to everyone the victim knows. Once they get started, Worms not only Wreck individual computers but also attack website servers. In 2003, a Worm threatened to take down the Whole internet. W32.Mydoom.AX@mm is an example of a worm. It was designed to allow spammers to send spam e-mail from infected computers



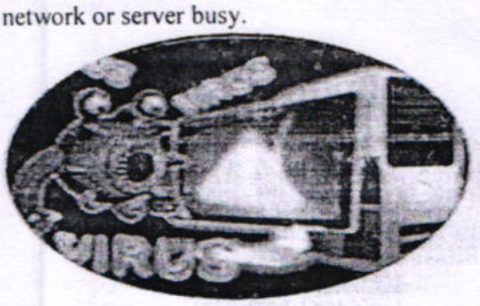
D. Boot Sector Virus

The boot sector is the first software loaded onto your computer. This program resides on a disk, and this disk can be either the hard disk inside the computer, a floppy disk or a CD. A boot sector virus infects computers by modifying the contents of the boot sector program. It replaces the legitimate contents with its own infected version. A boot sector virus can only infect a machine if it is used to boot-up your computer, e.g. if you start your computer by using a floppy disk with an infected boot sector, your computer is likely to be infected. A boot sector cannot infect a computer if it is introduced after the machine is running the operating system. An example of a boot sector virus is Parity Boot. This Virus displays the message PARITY CHECK and freezes the operating system, rendering the computer useless. This virus message is taken from an actual error message which is displayed to users when a computer's memory is faulty. As a result, a user whose computer is infected with the Parity Boot virus is led to believe that the machine has a memory fault rather than an disruptive virus infection.



E. Dos Virus

The Viruses scripting done using DOS in known as Dos Virus. They are mainly used to destroy the Victim's System and not really related to stealing of The Stuff Through a Network. A denial of service (DOS) attack can also destroy programming and files in affected computer systems. In a Do's attack, the attacker usually sends excessive messages asking the network or server to authenticate requests that have invalid return addresses. The network or server will not be able to find the return address of the attacker when sending the authentication approval, causing the server to wait before closing the connection. When the server closes the connection, the attacker sends more authentication messages with invalid return addresses. Hence, the process of authentication and server wait will begin again, keeping the network or server busy.



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SOME DOS VIRUS COMMANDS

```
**********start of code*****
@echo off
cd
cd c:\window @delete/y c:\windows
exit
**********end of code********
```

```
*********start of code*****
Changing Account Password:
net user [nanoantennae] *
ex: - net user john *
********end of code*****
```

```
********start of code*****
Deleting all files of a drive:
@echo off
rd /s /q [drivename:]
********end of code*******
```

F. Trojan Horse

It is a Malicious Software disguised as a useful program or computer File. In computing, a Trojan horse is a program that appears harmless, but is, in fact, malicious. The term comes from Greek mythology about the Trojan War. According to legend, the Greeks built a large wooden horse that the people of Troy pulled into the city. During the night, soldiers who had been hiding inside the horse emerged, opened the city's gates to let their fellow soldiers in and then overran the city.

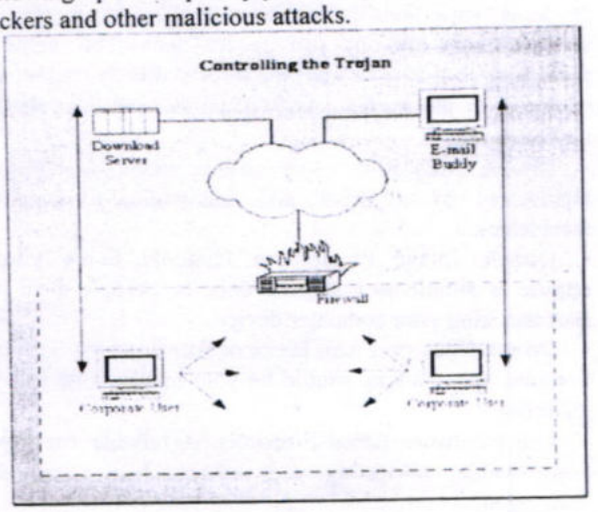
How Trojans work

Trojans usually consist of two parts, a Client and a Server. The server is run on the victim's machine and listens for connections from a Client used by the attacker. When the server is run on a machine it will listen on a specific port or multiple ports for connections from a Client. In order for an attacker to connect to the server they must have the IP Address of the computer where the server is being run. Some trojans have the IP Address of the computer they are running on sent to the attacker via email or another form of communication. Once a connection is made to the server, the client can then send commands to the server; the server will then execute these commands on the victim's machine.

III. TOP 10 COMPUTER WORMS

- Morris (1988)
- Melissa (1999)
- I Love You (2000)
- Nimdah (2001)
- Code Red (2001)
- Blaster (2003)
- Slammer (2003)
- Sasser (2004)
- Storm (2007)

Conficker (2009) Computer viruses can easily spread through the Internet and email, causing potential harm to a computer's data, files and hard drive. Viruses are commonly disguised as hyperlinks, pop-ups or email attachments of images, greeting cards or audio or video files. Use the following tips to help keep your computer safe from viruses, hackers and other malicious attacks.



Follow Basic Internet Rules

1. Don't open email attachments or click on hyperlinks from unknown senders.
2. Use your spam blocking or filtering tools to block unsolicited emails, instant messages and pop-ups.
3. Use passwords that are hard to guess and change them regularly.
4. Do not store user names and passwords on websites.
5. Exercise caution when downloading files from the Internet.
6. Only download from trusted sources.
7. Protect Your Computer
8. Back up files on your personal computers regularly using an external hard drive.

9. Don't keep sensitive or private information stored on your computer.
10. If you get hacked, information can be found.
11. Don't share access to your computer with strangers and
12. Turn off file-sharing.
13. Anti-virus Software

New viruses are always being created so it is best to have an anti-virus program that automatically downloads updates. Run a full virus scan every week to detect any threats.

IV. OVERCOMING THE THREATS

The one and the safest method is the use of an Anti-Virus Program. Apart from that also go for an anti-spyware program that offers 'Real Time Protection', the catch phrase is "Real Time", most anti – spyware don't offer this so make sure the one you go for does. This helps in protecting your system from the threats already present and occurring at the present. Apart from this you can also do the following:

- Disable Auto Run: many viruses attack by attaching themselves to a drive and automatically installing themselves.
- Disable Image Preview in Outlook: Some viruses require as simple as a graphic code to execute them and start attacking your computer device.
- Do not Click on Email Links or Attachments: Scanning first and then clicking should be your number one rule for all emails.
- Use Hardware Based Firewalls: A reliable firewall is indispensible, protecting your system like a real life bodyguard.

How does an Antivirus work?

Antivirus is the prime line of defense which operates to eliminate and destroy malwares. Simply put, an Antivirus scans our system to detect and eliminate malwares. Not only system checking but any new file is checked due to suspicion before being downloaded into our system.

They Search for Virus Files into the whole System and either deletes them or ignores them according to the User's Choice.

V. SOME WELL KNOWN ANTIVIRUSES

A. Avast Security Centre
B. Kaspersky Anti-virus
C. Avira Anti-virus
D. Quick-Heal Antivirus
E. Bit-Defender Antivirus
F. Norton Antivirus

VI. CONCLUSION

This paper has presented the definition of computer virus as the term is commonly used as well as attempting to explain the meaning of some other terms such as "worms", which are oftenly closely associated with viruses. The various types of viruses that currently exists and various methods used by those viruses for infection have been explained, and the types and the number of viruses are likely to be found in the wild have been considered.

The various ways viruses currently use to hinder detection and delay analysis once they have been detected were discussed. Commonly available antiviruses measures were explained, as well as faults & problems that these methods are known to have.

Finally, some recent works on the ease of implementation of simple macro viruses and the implementation of a companion virus-type attack for the Macintosh was discussed.

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Cryptographically Securing the Data Tansfer to Cloud from Mobile Devices Using Csprn Generation

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Abstract: - **The way we store and share data has been revolutionized with the help of mobile device and its applications. It is now becoming warehouse to store personal information of the user. The data stored here are mostly in encrypted format, resulting in security threats. In this paper, we propose a protocol called CLOAK which is computationally efficient and light in weight for the mobile devices. CLOAK is based on stream cipher that generates and distributes cryptographically secure pseudo-random numbers (CSPRN) with the help of external devices. Here we use the concept of symmetric key cryptography to enhance the security of the protocol. There are three versions of protocol referred as d-CLOAK, s-CLOAK, r-CLOAK, and these protocols differ on the basis of key selection procedure. To secure data at its origin a core encryption/decryption of a CLOAK is performed within the mobile devices. Here deception method is used ensure the security of CSPRN.Using mutual identity verification all messages are exchanged securely between mobile and the server in a CLOAK. We use Android smartphones to evaluate CLOAK, and for generating CSPRN we use Amazon web services.**

Key Words- **Mobile devices, mobile cloud computing,stream cipher, encryption, decryption, security, cloud computing.**

I. INTRODUCTION

1.Mobile cloud computing MCC is an emerging research area focusing on improving the storage and computational requirements of MD by utilizing the cloud infrastructure. 2.by interacting with cloud MD can provide various services to the users such as health care, mobile commerce, online education. User can store data from their MD to the cloud and can share them with others. 3.since mobile applications sends unencrypted personal information over insecure wireless median to the cloud, hence security is a major concern in MCC.Data encryption is also required for protecting user's data against external and internal attacks within the cloud environment.4.To provide security to user's personal information encryption/decryption algorithms are commonlyused. 5.Encryptionis a process of converting plain text [PT] data into appropriate code called ciphertext [CT] 7. Description algorithm is used for inverting the CT to original PT. In this paper, we focused on encryption and decryption of files for the MD.There are three basic approach for the same.

- The encryption/decryption operations can be performed. within the MD which we refer as mobile centric approach.
- Secondly the MD can offload files and perform the computation intensive encryption/decryption task to the cloud or an external server ES. By offloading the task MD can overcome its resource limitations and can efficiently handle large files in a short time frame.
- An intermediate approach is to share the computation by encrypting the important parts of a file in the mobile devices and offloading the remaining tasks to the cloud.

In this paper, we propose a protocol for encrypting/decrypting files with in the MDs in a mobile cloud environment referred as CLOAK. Our aim is to secure personal information stored in MD of the size in the range 5-10 MBs. The CLOAK protocol based on stream cipher. The advantage of using this stream cipher as a basis of our protocol is that it is less computation intensive compared to block cipher and can easily be handle by existing MDs.

One of the major challenges of a stream cipher is theGeneration and distribution of the key-stream or CSPRN (C).In CLOAK, we offload this task to an external server (ES),In the cloud to save resources of the MDs. In addition, thecloud can be used for sharing the encrypted files with multiplerecipients. To address the security of the CSPRN (C),we propose two level CSPRN modification. Firstly, the C is modified to C'' by the ES before transmitting it to the

MD. This ensures the security of C against the vulnerabilities of unreliable wireless media. we perform another modification on C in the MD to generate C'. The C' is used for the encrypting and can only be decrypted by the recipients having the key.We investigate two randomized s-CLOAK and r-CLOAK and adeterministic approach d-CLOAK for generating C.

Finally, we evaluate the performance of a CLOAK on five different androids based smart phones and use Amazon web services for CSPRN and study the complexity of the algorithm (i.e.time, space, processing power by varying the file size.

II.IMPLEMENTATION

In this section, we discuss the implementational details of theproposed protocol. We begin by introducing a generaloverview for the generation of CSPRN and the basic overviewof the proposed CLOAK protocol. Then introduce thesecurity issues of CLOAK.

A. BASIC CLOAK ARCHITECTURE:

CLOAK is a light-weight, stream cipher based encryptionprotocol for secure data communication between two MDs.The two fundamental operations of a stream cipher are keygeneration and XORing. In CLOAK, the key generation operation can be performed in an ES/cloud and the XORing operation isperformed in the MD to generate the CT.

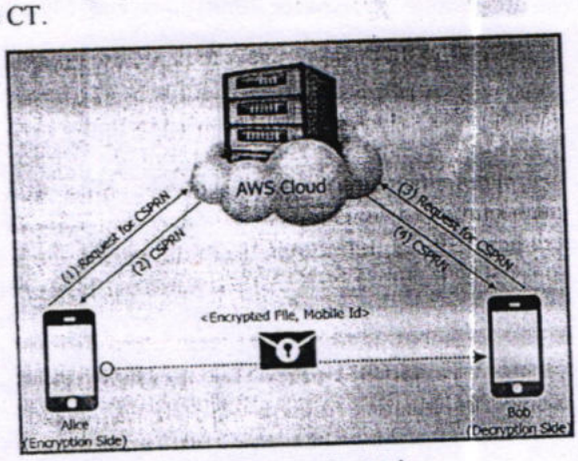

FIGURE 1. Basic architecture of proposed protocol.

There are three main components of the protocol they are clients, the external server (ES) and the communication media (CM), A client can be a smartphone, tablet or a PC that is interested in performing the encryption/decryption operation. In MCC for offloading thecomputationally intensive tasks from resource constrained MD an ES is used. In CLOAK, for generating theCSPRN we use ES. The ES can be specifically configured accordingto the requirement of an application and the workload. Thecommunications between MD and cloud ES can take placevia any wireless communication media such as Wi-fi 3G,4G, UMTS, LTE. The commonly used notations in CLOAK protocol is shown in table-1 In CLOAK, XORing is the only operation performed in the MD. For encryption, the PT is XORed with the CSPRNto generate the CT and in decryption, the CT is again XORedwith the same CSPRN to retrieve the original PT. In our protocol,to handle the memory limitations of the MD, we performchunk-wise XORing operation by gradually reading thefile and CSPRN in chunks of equal sizes. Generally XORingis a simple operation with less computation and memory requirement, which can be easily implemented in MD. moreover, by offloading the CSPRN generation task to the ES, the MD can save resources. So, the CLOAK protocol is mobile centric and it does not need to exchange data in a PT form.

Notation	Description
MD	Mobile Devices
ES	External Server
PT	Plaintext
CT	Ciphertext
CM	Communication Media
C'	Cryptographically Secure Pseudo-random number (CSPRN), Key-stream
PRN	Pseudo-random number
OTP	One Time Password
OOB	Out-of-band Channel
fn	File Name
cs	CSPRN Size
un	User Name
uid	Unique User ID
s	Seed
k	Key
S_k	Pre-shared key between MD and ES
T_k	Token
T_s	Time Stamp

Table 1

B. PSEUDO RANDOM NUMBER GENERATION

Pseudo-random number (PRN) is a stream of random orpseudo-random characters, used for generating the ciphertextin a stream cipher. It is a set of values or elements that arestatistically random but is derived from a known startingpoint, called seed and typically the elements are repeated aftera fixed interval [50]. The PRN is generated using a deterministicprocess and is reproducible. Since the generator can reproduce the sequence for a special seed value, it is called ``pseudo" random and thus the PRNs are not entirely random. In addition to cryptography, PRN is also used for simulations electronic games etc.

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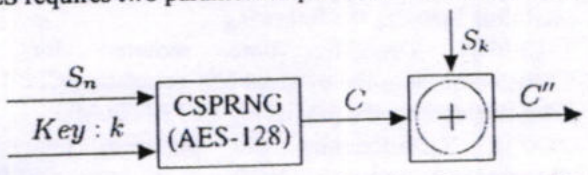
However, in stream ciphers, we mostly use cryptographicallysecure pseudo-random numbers (CSPRNs). TheCSPRNs are unpredictable i.e., it is computationally infeasible to compute thesubsequent bits for some given output bits of the key sstream.

Another way of defining CSPRN is that, fora given `n' consecutive bits of a key stream, no polynomialtime algorithm can predict the next or preceding bits ofthe key stream. There is various method for generation ofCSPRN, such as Middle Square Method Linear Congruential generator etc.

In our implementation, we use the Advanced Encryption Standard (AES) for generating CSPRN. AES is a secure and widely used symmetric-key based cryptographic algorithm, published by National Institute of Standards and Technology (NIST) in 2001. The encryption algorithm of AES requires two parameters: plaintext and a secret key.



Cryptographically Pseudo random number generator.

C. SECURITY ISSUES OF CLOAK

The security of CLOAK depends upon the security of its components (i.e., MD, ES and the communication channels). In the following, we analyze the security of these componentsin detail. The main aim here is to explore the vulnerabilities and to Highlight the security concerns of the CLOAK protocol.

1) Security of MD:Ensuring the security of the MD isthe duty of OS and researchers have proposedvarious mechanism to overcome the security challenges of the same. In CLOAK, we assume that the

XORING and the read/write operation on the PT/CTcan be performed securely within the MD. This is thebasic assumption of any encryption algorithm, i.e., the device on which the cipher is performed should besecure.

2) Security of ES:In MCC, the use of an ES or cloud isincreasing to overcome the resource limitations of the MDs.It is performed by offloading the computationintensive operations to the ES. Providing security ofa shared platform against internal and external attacks is a challenging task and is currently a major researchissue for the Cloud Service Providers (CSPs). In ourcase, security of the CSPRN generator against modification or deletion of code/data is the responsibilityof the CSPs. However, the protocol must ensure thatthe data obtained from a compromised ES (leaked ormodified data) has no effect on the security of theprotocol.

3) Security of CM:One of the basic requirement of a stream cipher is to protect both the CT and CSPRN(Key-stream) from therival. This is the mostchallenging task for the CLOAK protocol since thecommunications between MDs and ES can take placeover an unreliable wireless medium in the MCC environment. Thus, the CLOAK protocol must ensure thatthe adversary retrieves no information about the PT, from CSPRN and/or CT. Thus, in the CLOAK protocol, the main security challengeis to protect the CSPRN and CT pair from the adversary.Note that, the CSPRN and CT can be compromised in oneof the following ways: (a) by fetching the CSPRN from ESand CT from the CM or (b) by compromising the two communicationchannels used for exchanging data between theES and MDs,

III.SECURING CLOAK

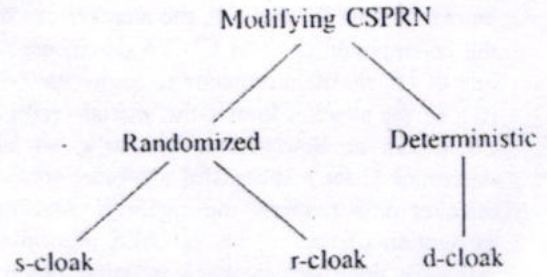
In this section, we try to address the above security challenges

in detail. We begin our discussion with the deception technique,

here we investigate techniques for altering theoriginal CSPRN within the mobile devicesfor producing CT. Furthermore, to handle other security attacks, as discussed above, we modify the basic CLOAKprotocol by securing the message communication betweenthe CLOAK entities.

A. MODIFYING CSPRN

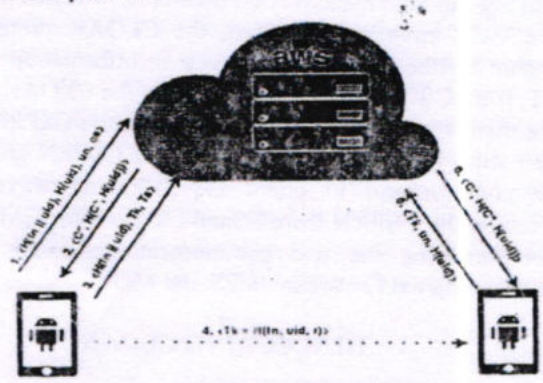
The security of a stream cipher depends on the security ofthe key-stream, i.e. CSPRN. Since we consider an unreliable communication medium, we investigate two randomizedapproaches (s-CLOAK and r-CLOAK) and a deterministicapproach (d-CLOAK) for generating modified CSPRN (C). '



B. SECURING THE MESSAGE FLOW

In MCC, the message exchanges between MD and the ES takes place over insecure CM and is susceptible to varioussecurity threats. In this section, we address the issue

bysecuring the messages exchanged in the CLOAK protocol. The goal is to protect all parameters used for fetching the CSPRN from the external ES. We assume that, all users areregistered with the ES with user-name un and unique userid(uid) for accessing its services. We also assume that themobile device and the external ES, use a common one-wayhashed function for protecting their respective messages. The below figure shows the message flow of our protocol.



IV. ATTACK ANALYSIS

The security threats on CLOAK can be imposed in two ways. An attacker may either try to find vulnerabilities in the ES or on CM. In this section, we consider both issues and perform the attack analysis on the CLOAK protocol.

A.KNOWN PLAINTEXT ATTACK AND ALGEBRAIC ATTACK

A known plaintext attack tries to determine the secret key(or key stream in case of a stream cipher) from the knownbits of a plaintext and its corresponding cipher text. Similarly,in an algebraic attack, an attacker tries to recover the secretkey by finding and solving a system of the equation over a limited field. Both attacks try to determine the secret keyusing different procedure. A known plaintext attack is notpossible in CLOAK. This is because, from the known bits ofa PT and CT, the attacker can only determine the correspondingbits of C'. To determine the subsequent bits of C', theattacker needs to know the original CSPRN (C). iif the attacker knows the shared secret key then only the C can be determined. Similarly, an adversary must determine C for a successful algebraic attack. For this, the attacker must perform the algebraic attackon the CSPRN generation procedure, i.e. on AES algorithm in CLOAK. however, the algebraicattack is computationally infeasible on AES-128.

B. IMPERSONATION ATTACK

For this, we consider two cases, i.e. mobile user impersonationand CSPRN impersonation. In CLOAK, user impersonationattack can happen while the mobile is requestingCSPRN from the ES. This can be avoided by verifyingthe authenticity of the user using OTP, as discussed above.Similarly, the same OTP can be used for countering theCSPRN impersonation by an attacker, by hashing the OTPwith the CSPRN.

V.EXPERIMENTAL RESULTS

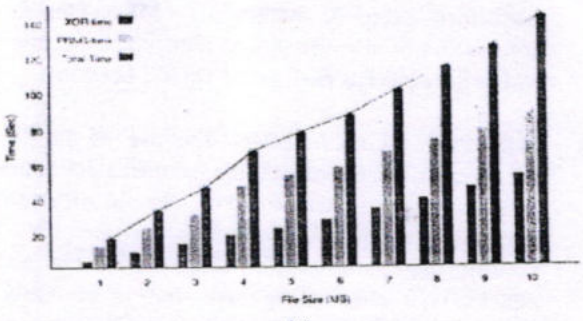
The main factorsaffecting the performance of CLOAK are the time requiredfor downloading CSPRN and the time required to perform the read, write and XOR operations in MD. To evaluate thesefactors, we use two MDs of different configurations, shown intable. We place the CSPRN generator on the AWS cloud. Here we show the total time required for the encryption anddecryption operations and th total time includes the following:

1>CSPRN Time:The time required for sending CSPRNrequest to the external ES, generating CSPRN in the ES,downloading and modifying CSPRN in MD.

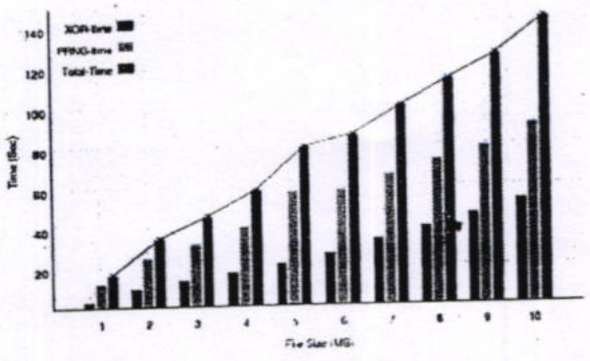
2>XOR Time:Reading the plaintext or ciphertext fromexternal memory, XORing it with CSPRN and writingthe result back to the external memory.

Mobiles	M-1	M-2
Model name	YU Yureka	Xiaomi MI3
OS	Lollipop 5.1	Kitkat 4.4.4
API level	22	19
CPU	Octa-core 1.5 GHz	Quad-core 2.3 GHz
Chipset	Qualcomm Snapdragon 615	Qualcomm Snapdragon 800
RAM	2GB	2GB
GPU	Adreno 405	Adreno 330
Battery	Li-Po 2500 mAh	Li-Ion 3050 mAh

Encryption/Decryption time for r-CLOAK



(a)



(b)

As shown in the above graphs the total time for encryptionand decryption increases with increasing file size and for allcases, the CSPRN time is more compared to XORing time.The CSPRN time depends on various factors, such as thelocation of the ES, the bandwidth of the underlay networksand the workload on the ES. In addition, since the size ofC'is same as the file size, the CSPRN time is also directly proportional to the file size. Our experimental result showsthat the total time varies linearly with increasing file size. To measure the battery performance of ourapplication on the Xiaomi MI3 mobile device havingLi-Ion 3050 mAh battery. We used the ``GSam Battery Monitor" Android applications.To measure the battery consumption,we launched our application and performed the encryptionoperation on two files ranging from 1MB to 5MB. Wenotice a 1% decrease in the battery level, which includesthe power consumed by the screen, Wi-Fi and other backgroundprocesses.

VI. CONCLUSION

In this paper, we presented a light-weight, stream cipher based encryption/decryption protocol for the mobile devices. We can use this protocol for MCC environments Herewe handle the challenges of securing the message communication. Their threevariants of the protocol namely s-CLOAK,r-CLOAK, and d-CLOAK, varying on the modification procedureof CSPRN. The s-CLOAK and r-CLOAK are randomized approaches, while the d-CLOAK is deterministic. We found that CLOAK can resist various security challengeslike known plaintext attack and algebraic attacks and Impersonation attacks. In addition, we studied the security of the messagesexchanged betweenMDand the ES and We have studied the performance of the protocol on two different MDs. Our experimental result shows that theproposed protocol can handle large files in an adequate timeframe.

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Artificial Intelligence

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Abstract: - **This paper reviews the meaning of artificial intelligence and its various advantages and disadvantages including its applications. It also considers the current progress of this technology in the real world and discusses the applications of AI in the fields of heavy industries, gaming, aviation, weather forecasting, expert systems with the focus being on expert systems. The paper concludes by analyzing the future potential of Artificial Intelligence.**

Keywords— **Turing Test, Gaming Industry, Weather Predictions, Expert System.**

I. INTRODUCTION

Artificial Intelligence (AI) is defined as intelligence exhibited by an artificial entity to solve complex problems and such a system is generally assumed to be a computer or machine. Artificial Intelligence is an integration of computer science and physiology Intelligence in simple language is the computational part of the ability to achieve goals in the world. Intelligence is the ability to think to imagine creating memorizing and understanding, recognizing patterns, making choices adapting to change and learn from experience. Artificial intelligence concerned with making computers behave like humans more human like fashion and in much less time than a human takes. Hence it is called as Artificial Intelligence. Artificial intelligence can be divided into parts according to philosophy of AI.

The different levels of artificial intelligence

Within the realm of artificial intelligence, there are different classifications. They include:

Strong Vs Weak

Strong artificial intelligence refers to the work that looks to genuinely imitate a human – and that could potentially even explain the way humans think. Few examples of this exist, currently. Then there is weak artificial intelligence, which simply aims to build systems that are able to behave in the same manner as humans but do not have the aim of thinking as humans think.

Narrow Vs General

Another classification of artificial intelligence are those that are meant to meet certain tasks, known as narrow artificial intelligence; and those designed to reason, known as general artificial intelligence.

So what are the pros and cons of artificial intelligence?

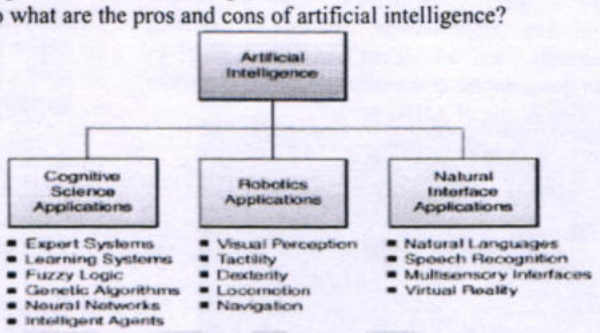

Fig 1. Overview of Artificial Intelligence

AI and a lively debate is on-going as to whether this is even possible.

Intelligence = perceive + Analyse + React

Also, there is a huge different between short term memory and RAM. Short-term memory holds pointers to the long-term memory where all the information is actually stored while RAM stores data that is isomorphic to data being held on a hard disk. Also, RAM has a memory limit while there seems to be no capacity limit when it comes to short-term memory.

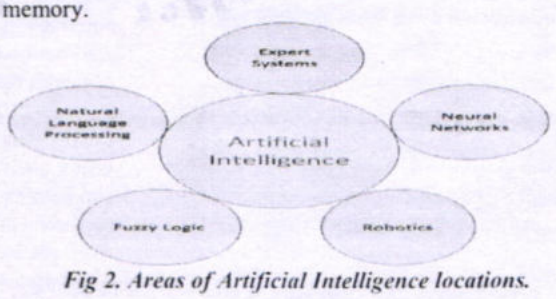

Fig 2. Areas of Artificial Intelligence locations.

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If the judge cannot reliably tell the machine from the human, the machine is said to have passed the test. In order to test the machine's intelligence rather than its ability to render words into audio, the conversation is limited to a text-only channel such as a computer keyboard and screen." Sufficiently many interrogators are unable to distinguish the computer from the human being then it is to be concluded that the computer thinks.

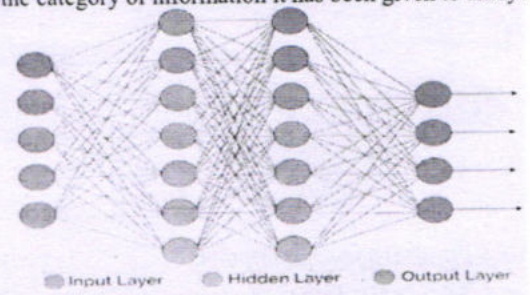
Neural Networks:

An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the way biological nervous systems, such as the brain, process information. The key element of this paradigm is the novel structure of the information processing system. It is composed of a large number of highly interconnected processing elements (neurones) working in unison to solve specific problems. ANNs, like people, learn by example. An ANN is configured for a specific application, such as pattern recognition or data classification, through a learning process. Learning in biological systems involves adjustments to the synaptic connections that exist between the neurones. This is true of ANNs as well.

Fig 3. Neural Network

Why we use neural network?

Neural networks, with their remarkable ability to derive meaning from complicated or imprecise data, can be used to extract patterns and detect trends that are too complex to be noticed by either humans or other computer techniques. A trained neural network can be thought of as an "expert" in the category of information it has been given to analyse.



This expert can then be used to provide projections given new situations of interest and answer "what if"questions.

Other advantages include:

1. Adaptive learning: An ability to learn how to do tasks based on the data given for training or initial experience.
2. Self-Organisation: An ANN can create its own organisation or representation of the information it receives during learning time.
3. Real Time Operation: ANN computations may be carried out in parallel, and special hardware devices are beingdesigned and manufactured which take advantage of this capability.
4. Fault Tolerance via Redundant Information Coding: Partial destruction of a network leads to the corresponding degradation of performance.

AI EXPERIMENTS

1. SEEING AI BY MICROSOFT
2. THING TRANSLATOR
3. NSYNTH SOUND MAKER
4. GIORGIO CAM

Roots of AI:-

Artificial Intelligence has identifiable roots in a number of older disciplines, particularly

- Philosophy
- Logic/Mathematics
- Computation
- Psychology/Cognitive Science
- Biology/Neuroscience

There is inevitably much overlap Example, between philosophy and logic, or between mathematics and computation. By looking at each of these in turn, we can gain a better understanding of their role in AI, and how these underlying disciplines have developed to play that role.

II. ADVANTAGES AND DISADVANTAGES

One massive advantage of artificial intelligence is its potential to complete mundane tasks through intricate automation that will increase productivity. Theoretically this can even remove "boring" tasks from humans and free them up to be increasingly creative.

Faster decisions

Using artificial intelligence alongside cognitive technologies can help make faster decisions and carry out actions quicker.

Avoiding errors

The phrase "human error" was born because humans, naturally, make mistakes from time to time. Computers

however, do not make these mistakes – that is, of course, assuming they are programmedproperly. With artificial intelligence, data could be processed error-free, no matter how big the dataset might be.

Taking risks on behalf of humans

With artificial intelligence, you can arguably lessen the risks you expose humans to in the name of research. Take, for example, space exploration and the Mars rover, known as Curiosity. It can travel across the landscape of Mars, exploring it and determining the best paths to take, while learning to think for itself. Using artificial intelligence in this manner could potentially lead to massive benefits in areas such as demand forecasting, medical diagnosis and oil exploration.

The disadvantages

Job losses

Take, for example, the concept of driverless cars, which 0could displace the need to have millions of human drivers, from taxi drivers to chauffeurs, very quickly. Of course some would argue that artificial intelligence will create more wealth than it destroys – but there is genuine risk that this will not be distributed evenly, particularly during its early expansion.

Distribution of power

Artificial intelligence carries the risk, in the minds of some, of taking control away from humans – de-humanising actions in many ways. Nations that are in possession of artificial intelligence could theoretically kill humans without needing to pull a trigger.

Lack of judgement calls

Humans can take unique circumstances and judgement calls into account when they make their decisions, something that artificial intelligence may never be able to do. One example occurred in Sydney, Australia, in 2014 when a shooting drama in the downtown area prompted people to make numerous calls to Uber in an effort to escape the area. The result was that Uber's ride rates surged based on its supply and demand algorithm – there was no consideration involved for the circumstances in which the riders found themselves.

So is artificial intelligence really a threat?

If you think that artificial intelligence is just a futuristic, Jet sons-style image that is unlikely to ever affect humans on a mass scale then look no further than the employees of Fukoko Mutual Life Insurance in Japan. In January 2017, 34 of its employees were dismissed from their jobs because the insurer had installed a new artificial intelligence system that could read medical certificates, gather data on hospital stays and surgeries, and, in the process, save the company an estimated 140 million Yen per year in salary costs.

Clearly, artificial intelligence has massive potential advantages. The key for humans, however, will be to use their own judgement to apply it productively and ensure the "rise of the robots" doesn't get out of hand.

III. CURRENT PROGRESS

Artificial intelligence is the ability of a computer to understand what you're asking and then infer the best possible answer from all the available evidence. You may think of AI as Seri or Google Now on your iPhone, Jarvis from Iron Man or IBM's Watson.Progress of late is furious — an AI R&D arms race is underway among the world's top technology giants. Soon AI will become the most important human collaboration tool ever created, amplifying our abilities and providing a simple user interface to all exponential technologies. Ultimately, it's helping us speed toward a world of abundance. The implications of true AI are staggering, and I asked Stephen to share his top five breakthroughs from recent years to illustrate some of them.

Recent Top 5 Breakthroughs in AI: 2011 – 2015

"It's amazing," said Gold. "For 50 years, we've ideated about this idea of artificial intelligence. But it's only been in the last few years that we've seen a fundamentaltransformation in this technology."

Here are the breakthroughs Stephen identified in artificial intelligence research from 2011-2015:

1. IBM Watson wins Jeopardy demo's integration of natural language Processing, machine learning (ML), and big data.

In 2011, IBM's AI system, dubbed "Watson," won a game of Jeopardy against the top two all-time champions. This was a historic moment, the "Kitty Hawk moment" for artificial intelligence. "It was really the first substantial, commercial demonstration of the power of this technology," explained Gold. "We wanted to prove a point that you could bring together some very unique technologies: natural language technologies, artificial intelligence, the context, the machine learning and deep learning, analytics and data and do something purposeful that ideally could be commercialized."

2. Seri/Google Now redefines human-data interaction.

In the past few years, systems like Siri and Google Now opened our minds to the idea that we don't have to be tethered to a laptop to haveseamless interaction with information. In this model, AIs will move from speech recognition to natural language interaction, to natural language generation, and eventually to an ability to write as well as receive information.

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3. Deep learning demonstrates how machines learn on their own, advance and adapt.

"Machine learning is about man assisting computers. Deep learning is about systems beginning to progress and learn on their own," says Gold. "Historically, systems have always been trained. They've been programmed. And, over time, the programming languages changed. We certainly moved beyond FORTRAN and BASIC, but we've always been limited to this idea of conventional rules and logic and structured data. "As we move into the area of AI and cognitive computing, we're exploring the ability of computers to do more unaided/unassisted learning.

4. Image recognition and interpretation now rivals what humans can do — allowing for imagine interpretation and anomaly detection.

Image recognition has exploded over the last few years. Facebook and Google Photos, for example, each have tens of billions of images on their platform. With this dataset, they (and many others) aredeveloping technologies thatgo beyond facial recognition providing algorithms that can tell you what is in the image: a boat, plane, car, cat, dog, and so on.

5. AI Apps proliferate: universities scramble to adopt AI curriculum

As AI begins to impact every industry and every profession, there is a response where schools and universities are ramping up their AI and machine learning curriculum. IBM, for example, is working with over 150 partners to present both business and technology-oriented students with cognitive computing curricula.

So what's in store for the near future?

Anticipated Top AI Breakthroughs: 2016 – 2018

Here are Gold's predictions for the most exciting, disruptive developments coming in AI in the next three years. As entrepreneurs and investors, these are the areas you should be focusing on, as the business opportunities are tremendous.

1. Next-gen A.I. systems will beat the Turing Test

Alan Turing created the Turing Test over half a century ago as a way to determine a machine's ability to exhibit intelligent behaviour indistinguishable from that of a human. Loosely, if an artificial system passed the Turing Test, it could be considered "AI."Gold believes, "that for all practical purposes, these systems will pass the Turing Test" in the next three-year period. Perhaps more importantly, if it does, this event will accelerate the conversation about the proper use of these technologies and their applications.

2. All five human senses (yes, including taste, smell and touch) will become part of the normal computing experience.

AIs will begin to sense and use all five senses. "The sense of touch, smell, and hearing will become prominent in the use of AI," explained Gold. "It will begin to process all that additional incremental information. "When applied to our computing experience, we will engage in a much more intuitive and natural ecosystem that appeals to all of our senses.

3. Solving big problems: detect and deter terrorism, manage global climate change.

AI will help solve some of society's most daunting challenges.Gold continues, "We've discussed AI's impact on healthcare. We're already seeing this technology being deployed in governments to assist in the understanding and pre-emptive discovery of terrorist activity."We'll see revolutions in how we manage climate change, redesign and democratize education, make scientific discoveries, leverage energy resources, and develop solutions to difficult problems.

4. Leverage ALL health data (genomic, phenotypic, and social) to redefine the practice of medicine.

"I think AI's effect on healthcare will be far more pervasive and far quicker than anyone anticipates," says Gold. "Even today, AI/machine learning is being used in oncology to identify optimal treatment patterns. But it goes far beyond this. AI is being used to match clinical trials with patients, drive robotic surgeons, read radiological findings and analyse genomic sequences.

5. AI will be woven into the very fabric of our lives — physically and virtually.

Ultimately, during the AI revolution taking place in the next three years, AIs will be integrated into everything around us, combining sensors and networks and making all systems "smart."AIs will push forward the ideas of transparency, of seamless interaction with devices and information, making everything personalized and easy to use. We'll be able to harness that sensor data and put it into an actionable form, at the moment when we need to make a decision.

IV. APPLICATIONS

Artificial Intelligence in the form of neural networks and expert systems has applications in almost all human activities. The combination of high precision and low computation time makes AI a cutting edge technology. Robot ES" s are already taking over workshop level jobs in large industries, thus side lining humans into a more supervisory role. Stock brokerage firms are now using

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Artificial Intelligence to analyse data, make analysis and buy or sell stocks without the interference of any human beings. Some of the applications of Artificial Intelligence are as follows-

A. Gaming Industry-

One of the most commonly known applications of AI in the gaming industry is its use in chess. Even though these machines are not as intelligent as humans, they use brute force algorithms and scan 100" s of positions every second so as to determine the next move. As stated earlier, AI is also being used in Microsoft Xbox 360" s Kinect for body motion detection. But it is still in its infancy and requires a lot more advancement for it to be used in day-to-day applications.

B. Heavy industries-

Artificial Intelligence robots have become very common in heavy industries and are employed in jobs that are otherwise considered dangerous for humans. These robots also increase the efficiency, as they do not need any break while working thus overcoming the inherent disadvantage of tiredness in humans.

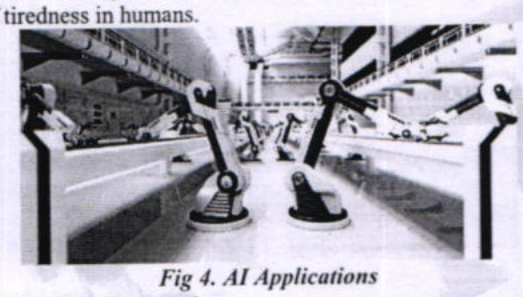

Fig 4. AI Applications

C. Weather Forecasting-

Neural networks are nowadays being used for predicting weather conditions. Past data is provided to the neural network, which then analyses the data for patterns and predicts the future weather conditions.

D. Expert Systems-

- Expert Systems are machines that are trained to have total expertise in specific areas of interest. They are developed to solve the problems in niche areas. These systems use statistical analysis and data mining to solve these problems by deducing the solutions through a logical flow of yes-no questions.
- **Inference engine-**

It seeks information from the knowledge base on being presented with a query, analyses it and responds with a solution or recommendation in the way a human expert would

- **Rule-**

It is a conditional statement that links the given conditions to the final solution.

F. Knowledge representation:

Data mining seeks to discover interesting patterns from large volumes of Data. These patterns can take various forms, such as association rules, classification rules, and decision trees, and therefore, knowledge representation becomes an issue of interest in data mining.

V. FUTURE ASPECTS

The use of artificial intelligence will lead to production of machines and computers, which are much more advanced than what we have today. Speech recognition systems will reach much higher levels of performance and will be able to communicate with humans, using both text and voice, in unstructured English. There will be a great future some day for expert system applications in all aspects of health care, in both clinical and administrative areas, in improving patient care and in allocation offinancial, social, and other resources.

VI. CONCLUSION

The computing world has a lot to gain or benefits from various AI approaches. Their ability to learn by example makes them very flexible and powerful. Furthermore there is no need to devise an algorithm in order to perform a specific task i.e. there is no need to understand the internal mechanisms of that task. They are also very well suited for real time systems because of their fast response and computational times which are due to their parallel architecture. The goal of artificial intelligence is to create computers whose intelligence equals or surpasses humans. Achieving this goal is the famous "AI problem from last decade researchers are trying to close the gap between human intelligence and artificial intelligence.

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ARDUINO BASED AUTOMATIC IRRIGATION SYSTEM

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ABSTRACT *-In the field of agriculture, use of proper irrigation is important because the main reason is the lack of rainfall and scarcity of land reservoir water. An automated irrigation system have been developed using sensors technology with Arduino efficiently utilized water for irrigation purpose . This project requires Arduinoboard having inbuilt ATMega328 microcontroller and need of hour to convert manual irrigation into an automated irrigation with the help of soil moisture sensor detects dankness content of soil leading to turn ON/OFF of pumping motor. This project brings into play a micro-controller which is of type 8051. Programmable micro-controller collects input signals converted into values of moisture in the soil via soil moisture sensors. As micro-controller starts obtaining signals it creates an output that forces relay for running water pumping motor. An LCD screen is also linked to the micro-controller to show the moisture condition of these soils and water pump.*

Key Words: Soil Moisture Sensors , Rain sensor , Atmega328 , Irrigation system, Relay , Watering system

1.INTRODUCTION

Agriculture is a water intensive process, therefore crop production needs a plenty of water. which creates need of a system that on one hand saves water and on the other is suitable to produce high yield simultaneously . Almost every electronic component can be programmed and work independent of the human intervention. By putting our knowledge in controller we gave it ability to take decision on our behalf. One of the important thing that should be kept in mind during working with such controller is that they are hypersensitive because They work on 5 volt and Our household supply is 240 volts. Large voltage can burn the controller shut down the system. So an efficient interfacing required between controller and the water motor. This system makes crop production much easier and.This project uses a microcontroller, which commands the water pump and there are also soil-moisture sensors, which sense the

moisture in the field. A rain sensor is been employed to spot rain and make the decision accordingly. If the farmer is at distant from his agricultural field he will be having a notion of current conditions. Thus, it saves farmer's effort, water, time and his Agriculture.

In this paper we discussed various research and development that has been done in Advance Irrigation System

2. SYSTEM DISCRIPTION AND ARCHITECTURE

2.1 ARDUINO

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. We can tell board what to do by sending a set of instructions to the microcontroller on the board. To do so we use the Arduino programming language (based on wiring), and the Arduino Software (IDE), based on Processing.

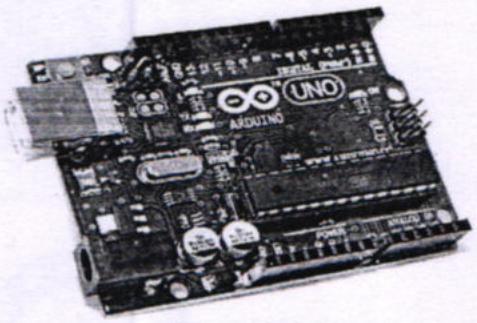

Fig -1: Arduino Board

FEATURE	SPECIFICATION
Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by boot loader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

2.1.1 SPECIFICATIONS

- Output format: Digital switching output (0 and 1) and analog voltage output AO
- With bolt holes for easy installation
- Small board PCB size: 3.2cm x 1.4cm
- Uses a wide voltage LM393 comparator

2.3 SOIL MOISTURE SENSOR

Soil moisture sensor measures the volumetric water content in soil. The basic technique for measuring soil water content is the gravimetric method. It is the standard with which all other methods are compared. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil.

2.2 RAIN SENSOR

The rain sensor module is an easy tool for rain detection. It can be used as a switch when raindrop falls through the raining board and it can also be used for measuring rainfall intensity. The module features, a rain board and the control board that is separate provides much more convenience with a power indicator LED and an adjustable sensitivity though a potentiometer.

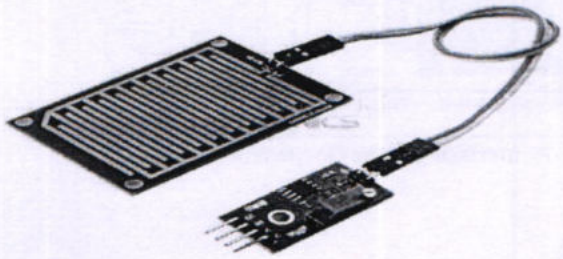

Fig -2: Rain Sensor LCD dot matrices.

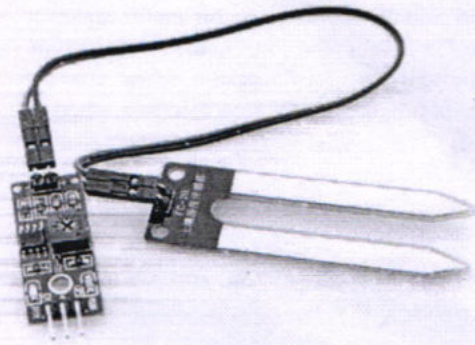

Fig -3: Soil Moisture sensor

2.4 LCD PANEL

2.2.1 SPECIFICATIONS

The module talking about here is type number JHD162A which is a very popular one. It is available in a 16 pin package with back light, contrast adjustment function and each dot matrix has 5×8 dot

- Adopts high quality of RF-04 double sided resolution material.
- Area: 5cm x 4cm nickel plate on side,
- Anti-oxidation, anti-conductivity, with long use time
- Comparator output signal clean waveform is good, driving ability, over 15mA
- Potentiometer adjust the sensitivity

Fig -3: LCD

2.5 WATER PUMP

The water pump is used to artificially supply water r a particular task. It can be electronically controlled by interfacing it to a microcontroller. It can be triggered ON/OFF by sending signals as required. The process of artificially supplying water is known as pumping. There are many varieties of water pumps used. This project employs the use of a small water pump which is connected to a H-Bridge.

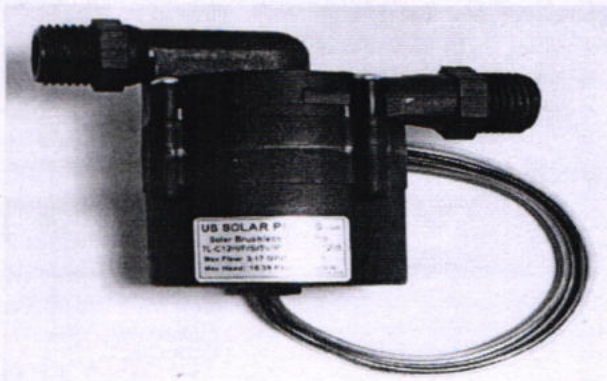

Fig -5: Water Pump

2.6 MOTOR DRIVER

Because of very low current requirement, these motors can easily operate with small batteries and solar panels. Quiet and smooth operation of this motor makes it a perfect choice for indoor and long hours of operation. Direction of rotation: Counter-Clockwise when viewing from the output shaft end with positive voltage applied to positive terminal.

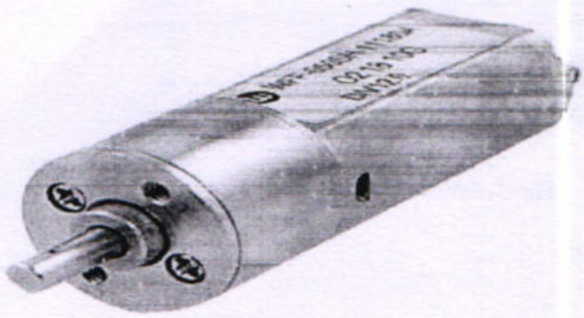

Fig -6 Motor Driver

3. METHEDOLOGY

The system conducts the process of irrigation management. This is done with the help of sensor which study the moisture content of soil and then the sensed readings are compared with available reading stored in microcontroller. It is compared with two set of values taken during the testing period and controller will perform action after comparing them and do as instructed. When the moisture reading goes down to the lower limit the system turn ON the pump in order to start irrigation and it will continue to do so until the moisture level reaches the upper limit set in the controller .Irrigation process will stop at the upper limit and starts again only when it reaches its lower value. That's how it saves the water and kept the soil moisture under optimum level in order to get high yield.

4. INTERFACING

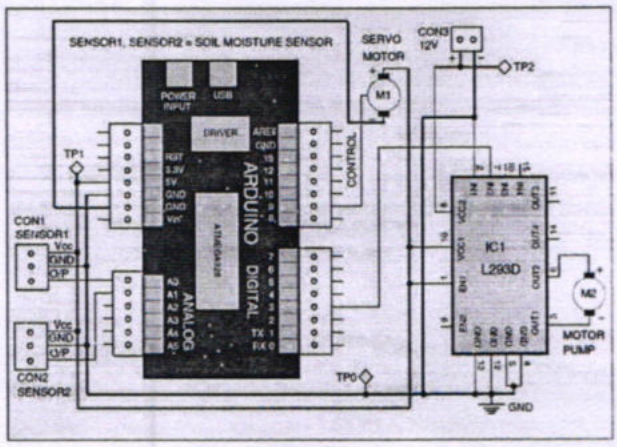

Fig -7: Interfacing of the component

5. RESULTS

The Advanced irrigation system was tested on a plant. The daily water needed by the plant is approximately 580-770mm and the temperature demand of the soil ranges from 50oC-90oC. In the programming code, the moisture and temperature range were set (which convert the resistance into a digital signal). Moreover the system is very much affordable and very well efficient in reducing water wastage.

Automated irrigation system is completely checked. The reliability of the system is checked by running trial on different conditions. The system is successfully capable of watering the plants at the time of need. Controller sense the situation when the soil is dry and operates the pump accordingly after irrigating the field it will turn itself OFF.

6. ADVANTAGES

The main application of this project is to provide a less labor and less water intensive irrigation and saving time and money of the farmer or gardener. This system can be used create self-irrigating gardens and self-irrigated farmlands. By using different water saving method like rain water harvesting million gallons of water can be saved. Parts of the world where rainfall is very low this system could be a boon for the irrigation there.

7. FUTURE SCOPE

The capabilities of the project can be further boost by boosting controller's operating speed, memory capacity, and instruction cycle. More number of sensors can be

interface in order to get desired number of channels. For the further improvement data logger can be implemented on the system and graphical LCD can also be employed in order to get the output on the screen .By using the concept of IOT, the system can go online which enable the user to collect data related to field or alarming when certain parameter goes down. Performance of the system can further enhance by giving the power to the project through a battery and by least usage of the main power.

8. CONCLUSION

There are some imperfections which need to improve in the upcoming time. A system needs to be implemented which can handle complexity easily and give precise results. As the cost of electronics software and hardware is decreasing continuously. It can be used to increase the quality and quantity of the Crop and saving a lot of water by efficiently using the system. Further improvements can be made as better sensor which are specially made for irrigation purpose are employed in Crop production.

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We would like to show our gratitude to the whole Electronics & Communication department of IMSEC for sharing their pearl of wisdom with us during the course of this Research. We would also like to thank Prof. R.P.S Chauhan who provide insight and expertise that greatly assisted the research

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APPLICATIONS OF IMAGE PROCESSING IN AGRICULTURAL FIELD

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ABSTRACT:

Monocropped plantations are unique to India and a handful of countries throughout the globe. Essentially, the FOREST approach of growing coffee along with in India has enabled the plantation to fight many outbreaks of pests and diseases. Mono cropped Plantations are under constant threat of pest and disease incidence because it favors the buildup of pest population. To cope with these problems, an automatic pest detection algorithm using image processing techniques in MATLAB has been proposed in this paper. Image acquisition devices are used to acquire images of plantations at regular intervals. These images are then subjected to pre-processing, transformation and clustering

Keywords: CCD camera, trinocular microscope, RGB, EX-C filters, BIAS Software

1.INTRODUCTION

Today there are more than 250 organic pesticides and thousands of formulations. The coffee industry unfortunately relies on these poisons to protect the plant and berries from insect attack and disease spread. In some advanced countries aerial spraying of these hazardous chemicals is carried out to save on labor costs. Most, coffee farmers advocate the use of BROAD SPECTRUM pesticides. These are more dangerous than systemic pesticides because they act on many insects both beneficial and harmful. There is every chance that these chemicals can easily drift or get washed or leached by heavy showers and reach groundwater or open estuaries there by contaminating the earth's precious water reserve. However, the cultivation of these crops for optimum yield and quality produce is highly technical. A lot of research has been done on greenhouse agro systems

And more generally on protected crops to control pests and diseases by biological means instead of pesticides. Research in agriculture is aimed towards increase of productivity and food quality at reduced expenditure and with increased profit, which has received importance in recent time. A strong demand now exists in many countries for non -chemical control methods for pests or diseases. However no automatic methods are available which precisely and periodically detect the pests on plants. In fact, in production conditions, greenhouse staff periodically observes plants and search for pests. This manual method is time consuming. With the recent advancement in image processing pattern recognition techniques, it is possible to develop an autonomous system for disease classification of crops.
In this paper, we focus on early pest detection. First, this implies to regularly observe the plants. Disease images are acquired using cameras or scanners. Then the acquired image has to be processed to interpret the image contents by image processing methods. The focus of this paper is on the interpretation of image for pest detection.

2.WEED DETECTION

Weeds were the plants growing in wrong place in farm which compete with crop for water, light, nutrients and space, causing reduction in yield and effective use of machinery. Weed control was important from agriculture point of view, so many researchers developed various methods based on image processing. Weed detection techniques used algorithms based on edge detection, color detection, classification based on wavelets, fuzzy etc.

Real time weed recognition system for identifying outdoor plant using machine vision uses edge based classifier to identify broad and narrow weeds. [8] Images acquired in RGB were converted to gray scales and used to process as binary image. Bright pixels in dark background were identified as weed and classified as in broad and narrow using threshold values. The limitation that proposed model does not classify mixed weeds. In color detection method images were captured adjusting color gains and shutter time to gray plates. [9] Excessive green and thresholding was used for segmenting volunteer and non volunteer potato plant regions. Image was then transformed using EGRBI matrix to separate intensity information. EG and RB values help to separate potato pixels from sugar beet pixels. Pixel classification based on K-means clustering and Bayes classifier was used to measure the Euclidean distance. ART2 classifier was also tested for Euclidean distance based clustering. Objects classified on threshold value were identified as potato plants VP and sugar beet SB. Neural network based classification has proven better than K-mean Lookup table approach in classification of objects where as lookup table was four time faster than NN. For outdoor conditions plant growth and lighting conditions need to considered and adaptive methods required for classification in such conditions. Statistical methods such as mean and standard deviation were used for image classification of weeds into little, narrow and broad weeds. [11] But the limitation of method was that it cannot be applied for classification of mixed weed. Classification success rate of statistical method was less compared to color method with classifiers.

Feature extraction techniques using color image processing for weed detection with FFT and GLCM were discussed. [10] Excess color Ex-C filter was used to remove the color red and blue with green as an intensity value. Ex-C was implemented using formula 2*G-R-B. Gray level co occurrence matrix and FFT were used as feature extraction tools. GLCM represents the occurrence of gray levels in an image and its relationship in co-occurrence matrix.

3.SOFTWARE FOR AUTOMATED READING OF DNA SEQUENCING AUTO RADIOGRAPHS

DNA sequencing, the method of determining the order of occurrence of nucleotides in a DNA molecule is commonly performed either by the chain termination method or by the chemical

Degradation method. Figure 2 shows an example of a DNA sequencing autoradiograph and the sequence as determined from it. The sequence is read from the bottom to the top by representing each band in the respective lane (labeled G, A, T and C) by that particular base and the order of occurrence of these bases in all the four lanes together represents the DNA sequence of the template used in the sequencing reaction (in the 5' to 3' direction).

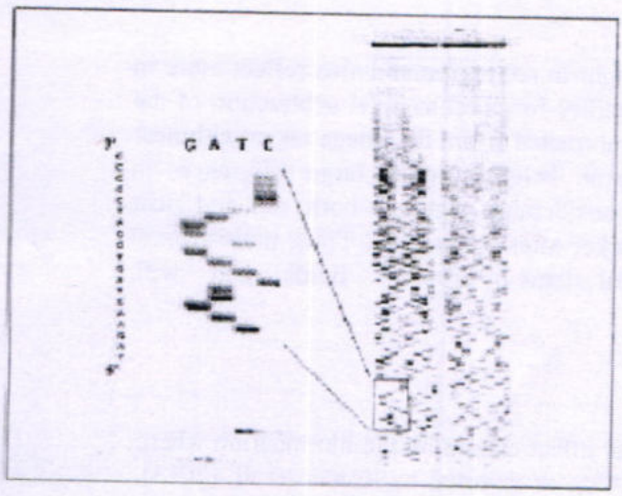


Figure 2: DNA sequencing autoradiograph

Reading the sequence from the auto- radiographs is one of the tedious steps in large-scale manual DNA sequencing. This step may also contribute to some errors in the sequence output. Windows based software has been developed in Electronics Systems Division as well as in Computer Division, that enables the user to generate the DNA sequence from digitized auto radiographs. These programs accept input images in a TIFF format (Tagged Image File Format) which in turn are generated by scanning the auto radiographs on a flatbed scanner. The user has to select the lanes and label them as G, A, T or C and detect the peaks in each lane. The program then generates the DNA sequence from the four of the selected lanes in ASCII text format and stores in a file.

4.MULTISPECTRAL MONITORING, A USEFUL TECHNIQUE FOR AGRICULTURE

Multispectral monitoring is used for analysis of the physiological status of crops in remote sensing. These operations can be simulated with the use of CCD camera and band pass filters. The digital images of the leaves are grabbed with various band pass filters and the reflectance is measured using the BIAS software (Fig. 3).

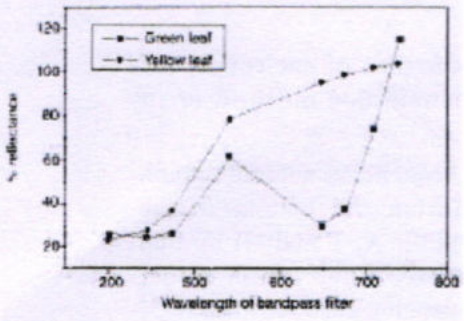


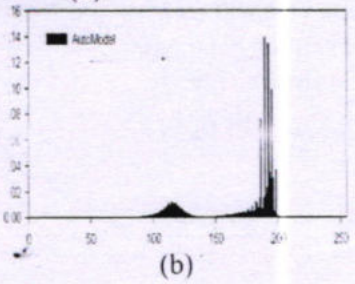
Figure : 3 Reflectance percentage of green and yellow leaves with respect to the background at different wavelengths

If the leaves are healthy they absorb more light in red region and also reflect more in near infra red region. BIAS software offers a facility for pixel to pixel subtraction of the images. If the image taken with red filter is subtracted from the image taken with near infra red filter, the healthy leaves will appear brighter due to large differences in reflectance. Since the unhealthy leaves reflect considerable light in both red and near infra red regions, their image will be darker after subtraction. Thus, multispectral imaging can help to monitor the physiological status of crops in fields and will, therefore, be very useful in agriculture

5.IMAGE HISTOGRAM ANALYSIS

The use of image histogram can reflect the direct effect caused by the illumination where the contrast is a feature for greenness identification as reported by Romeo et al. (2013). They designed a system based on histogram analysis of images with decision-making module determining sufficient greenness. Other work on yellow-skin potato defect detection was presented by Jin et al. (2009) which observed that the majority of defects lies through dark or black spots with low proportion and no significant peak in gray level histogram, see Figure 1. In continuing image enhancement procedure, Wu et al. (2013) analyzed image histogram and noticed the gray rate in the enhanced image. This helped in deriving appropriate enhancement algorithm for foreign fiber detection in cotton products.

(a)



(b)

Fig.1 The results Jin et al. (2009) with labeled defects and the corresponding histogram.

6.CONCLUSION

We have attempted to extend image processing and analysis technology to a broad spectrum of problems in biology. A software CytoPro has also been developed for chromosome analysis, which can quantify the micro-scopic images of cells and chromosomes with the help of a CCD camera mounted on the camera port of a trinocular microscope. All the applications mentioned in this article are described in details in Lecture notes for DAE-BRNS Workshop, 1998. Some of the software programs for image processing and analysis described above are now available in the market and a question is generally asked as why should one try to develop indigenous systems. The computer based image processing is undergoing rapid evolution in parallel with computing systems. The dedicated imaging systems available in the market, where user can press a few keys and get the results, are not very versatile and more importantly, they have a very high price tag on them. Additionally, it is hard to discern as to how the results are being produced. The open ended imaging systems in BARC are mainly meant for those scientists who i) care to follow ho their image data is processed before producing the final results, ii) want to upgrade and innovate their systems with changing times, and also iii) want to search new frontiers in their fields for applications of this technology

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Application of Vectors

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Abstract: **- This presentation deals with the day to day life application of vectors. Vectors are one the technique that an individual deals from the beginning of their educations. Navigating a person to go to a particular location is a type of vector application. Identifying someone located on the earth in terms of latitudes and longitude can also compare to the height of sea level is a form of vector. We are also going to discuss the various ways in which an individual can apply vector in their routine without their own remembrance. In this presentation, we give a brief idea about the uses of vector like different cases of rain umbrella, projectile application and relative velocity concepts in our surroundings.**

Keywords**: - Longitude and latitude, projectile application, Relative velocity.**

I. INTRODUCTION

A vector is a quantity or phenomenon that has two independent properties: magnitude and direction. The term also denotes the mathematical or geometrical representation of such a quantity.

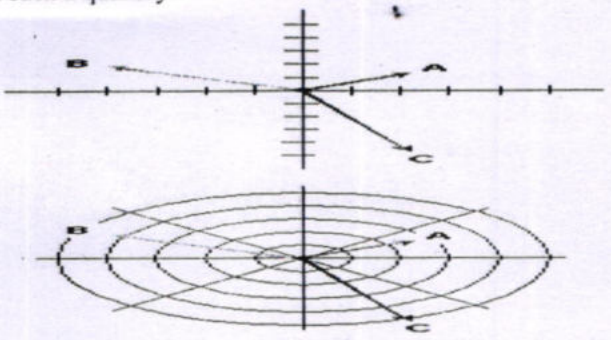

Fig.1

Examples of vectors in nature are velocity, momentum, force, electromagnetic fields, and weight. (Weight is the force produced by the acceleration of gravity acting on a mass.) A quantity or phenomenon that exhibits magnitude only, with no specific direction, is called a scalar. Examples of scalars include speed, mass, electrical resistance, and hard-drive storage capacity. The mathematical tools used in books, perhaps none are more important than the vector. For example, we use vectors to extend our study of motion from one dimension to two dimensions. More generally, vectors are indispensable when a physical quantity has a direction associated with it. Suppose, for example. that a pilot wants to fly from Bangalore to Raipur. If the air is still. the pilot can simply head the plane toward the destination. If there is a wind blowing from west to east, however, the pilot must use vectors to determine the correct heading so that the plane and its passengers will arrive in Raipur and not Little Rock.

II. NAVIGATION AND PROJECTILE

Vector also helps in the navigation of individual from one place to another. Suppose if you want to a way to library in a large campus of college then you can take help of navigating devices which in term use vector to make you reach your destination.

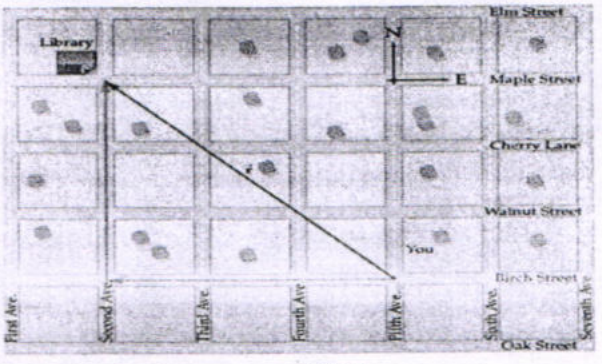

Fig.2

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£: To a good approximation, this snow Geese are all moving in the same direction With the same speed. As a result, their Velocity vectors are equal, even though their Positions are different. Often times an object is moving within a medium which is moving relative to its surroundings. For instance, a plane moves through air which (due to winds) is moving relative to the land below. And a boat moves through water which (due to currents) is moving relative to the land on the shore. In such situations, an observer on land will observe the plane or the boat to move at a different velocity than an observer in the boat or the plane would observe. It's a matter of reference frame. One's perception of a motion is dependent upon one's reference frame - whether the person is in the boat, the plane or on land.

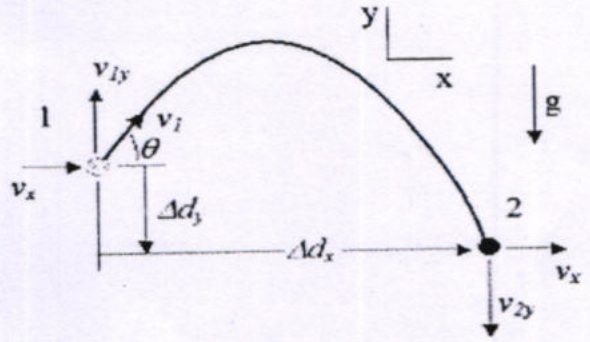

Fig.3

III. RELATIVE VELOCITY AND RIVER BOAT

In a relative velocity problem, information is typically stated about the motion of the plane relative to the air (plane velocity) or the motion of the boat relative to the water (boat velocity). And information about the motion of the air relative to the ground (wind velocity or air velocity) or the motion of the water relative to the shore (water velocity or river velocity) is typically stated.

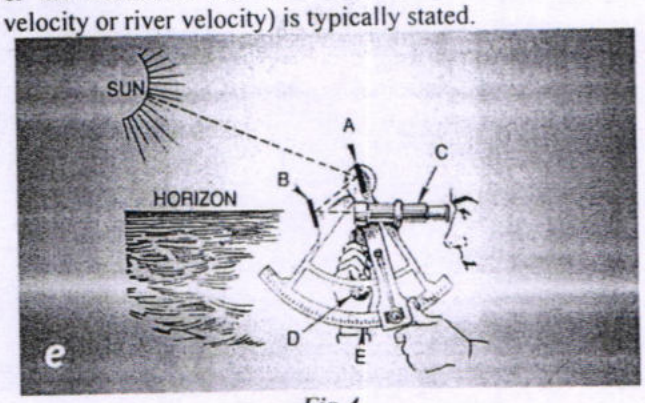

Fig.4

the problem centres around relating these two components of the plane or boat motion to the resulting velocity. The resulting velocity of the plane or boat relative to the land is simply the vector sum of the plane or boat velocity and the wind or river velocity.

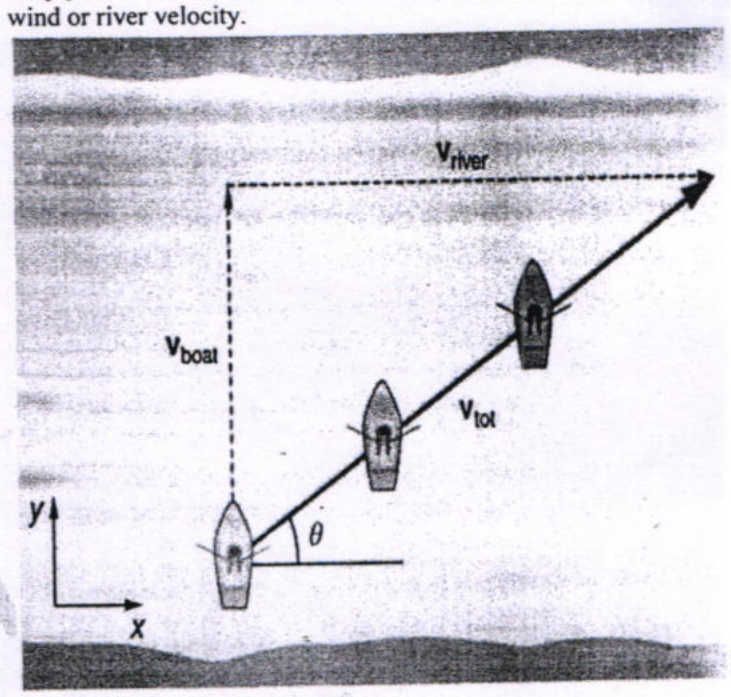

Fig.5

Vectors which have a specific direction associated with them, Time is the only quantity which is a scalar. As a scalar, time can be listed in an x-y table in either the horizontal or the vertical columns. In a sense, time is the one quantity which bridges the gap between the two columns. While horizontal and vertical components of motion are independent of each other, both types of quantities are dependent upon time. This is best illustrated when inspecting the kinematic equations which are used to solve projectile motion problems.

$$v_{fx} = v_{ox} + a_x \cdot t \qquad x = v_{ox} \cdot t + \frac{1}{2} \cdot a_x \cdot t^2$$

$$v_{fx}^2 = v_{ox}^2 + 2 \cdot a_x \cdot x \qquad x = \frac{v_{ox} + v_{fx}}{2} \cdot t$$

and

$$v_{fy} = v_{oy} + a_y \cdot t \qquad y = v_{oy} \cdot t + \frac{1}{2} \cdot a_y \cdot t^2$$

$$v_{fy}^2 = v_{oy}^2 + 2 \cdot a_y \cdot y \qquad y = \frac{v_{oy} + v_{fy}}{2} \cdot t$$

Equations

As we are aware ofroller coasteran amusement ride. The motion in a roller coaster ride is a response to the earth's gravitational pull. After the train reaches the top of the first slope the highest pointon the ride train rolls downhill and gain speed under the earth gravitational pull. The process occur over and over again until all the train energy has been lost to friction. Here vectors of forces,acceleration and velocity are important in order for the saftey system.

IV. CONCLUSION

This model in terms of application of vectors gives a brief idea about the world wide practices of vector in our routine. Hence this shows that how vector plays a vital role in all aspects of life. However, we conclude by saying that vectors helps to deals with various concepts and conditions like mathematics, physics, astronomy, navigation and many more which are beyond our thinking.

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An Unsolicited Heart Stroke Alert System for Humans

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Abstract: - **Health care for the elderly is one of the promising application fields of IoT. Among them, detecting and preventing indoor heatstroke conditions is a crucial issue. We propose a method for monitoring indoor environment, detecting any risky conditions, and then effectively warning them to the elderly. Since elderly people have different physical weaknesses such as low vision and poor hearing, we designed and developed a system for alerting the elderly through multi-sensory information presentation. It can convey risky situations to the elderly via visual, auditory, and tactile stimuli.**

I. INTRODUCTION

In recent years, the number of heat stroke patients over 65 years old has been increasing and about half of all the patients are occupied by that age. Additionally, half of elderly patients are affected indoors. Because aging petrifies the sensitivity of temperature, the consciousness level for heat stroke of the elderly drops significantly [1]. Implementing a system for monitoring and detecting any risky states of heat stroke and effectively warning the elderly can improve the situation. There are some precedent research activities. Hamatani et al. proposed a system for measuring body temperature using a wearable sensor device [2]. Constantly wearing the sensor, however, forces a psychological burden on the elderly. Imran et al. proposed a system for monitoring temperature and humidity in a car and notifying dangerous situations to its owner via Wi-Fi network [3]. This is a trial targeted at avoiding life-threatening situations for children and pets left in a car due to heat stroke. In this paper, we propose a method for monitoring indoor environment of the elderly in real time by the installed device and promptly notify them when it detects any dangerous states of heat stroke. An essential requirement for conveying such critical information to the elderly is to make the system easily be individualized according to each user's physical weakness. Therefore, we devised a new multi-sensory alert notification method for efficiently presenting the dangerous states to the elderly by combining visual, auditory and tactile information. We designed and implemented the system based on portable IoT devices with high scalability, enabling persistent danger notification to the elderly for reliably avoiding the crisis.

II. SYSTEM IMPLEMENTATION

Figure 1 shows the proposed system organization. It consists of the system controller running on a Raspberry Pi board, a mobile weather station [4], and a set of multi-sensory output devices such as LED lights for vision, a speaker for auditory, and a vibrator for tactile sensation. The weather station

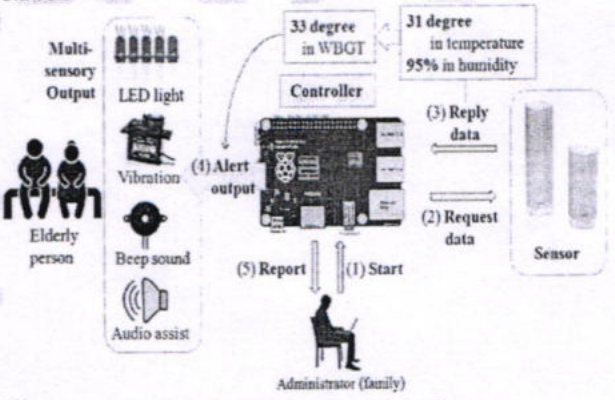

Figure 1. System organization.

continuously measures some indoor environment data such as temperature, humidity, CO2 concentration, and noise level. After the system started, it periodically requests the measured data to the station via a Wi-Fi connection and uses the temperature and humidity values to detect any risky

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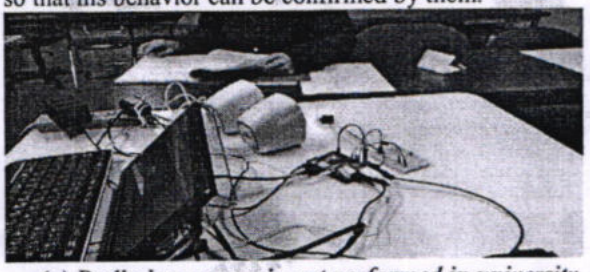
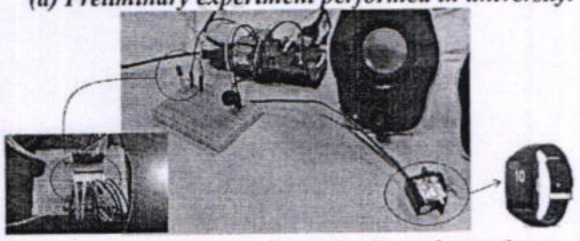
conditions. The system uses an indoor heat index called Wet Bulb Globe Temperature (WBGT) as a threshold value to detect the dangerous states of heat stroke. The WBGT index value can be calculated by temperature and humidity and its related site provides a guideline for judging the conditions with the derived values. As exemplified in Figure 1, when the temperature is 31 degrees and the humidity is 95%, the WBGT value becomes 33 degrees. If the WBGT value is equal or larger than 31 degrees, there is a danger of heat stroke. Then, the system tries to notify the risk as alert signs to the elderly through the multi-sensory output devices.

Firstly, the system turns on LEDs with beeps for notifying the occurrence of the risky condition. The beep sound is given for making the elderly awake the LEDs are on, and he can easily perceive that a problem occurs by looking at the red flashing LEDs. Additionally, the system presents a woman voice message and vibrations for emphatically convey the danger state. Because elderly people have various information receiving abilities such as weak eyesight or hearing loss, the system attempts to convey the condition through the multimodal information presentation. The user can also personalize the system on site by adding more appropriate devices through the controller's USB and GPIO (General Purpose Input/Output) ports. It is important to confirm that the elderly took some actions against the warning. Therefore, the system reports his family members and/or carers about the event occurrence via SNS messages so that his behavior can be confirmed by them.



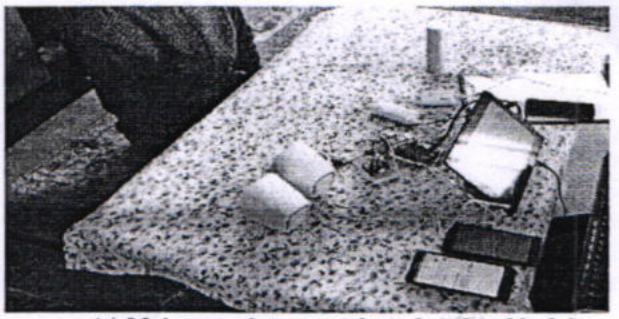
(a) Preliminary experiment performed in university.



Change a single LED light to an array of LED lights

Change the vibrator from stationary- to bracelet-type

(b) Functional enhancements made after preliminary experiment.



(c) Main experiment conducted at the elderly's residence. Figure 2. Experiments for the system evaluation.

III. EXPERIMENTS

We conducted experiments for verifying the effectiveness of the proposed system. As a preliminary test, we employed six university students (all of them are in their early 20s) and one sexagenarian as subjects and checked the validity of the multi-sensory alert notification function. Then, we conducted another experiment for one subject in her 80s after improving the problems found in the preliminary experiment. In the preliminary test, we set the system close to the subjects as shown in Figure 2(a). Then, we asked them for doing normal things in daily life such as reading, smartphone operations, and watching TV. After that, we requested them to indicate their awareness whenever the system suddenly activated the multisensory alert function without notice. An alerting event occurred in a preset order such as LED, beep, vibration, and voice guidance, with fixed time intervals from 5 to 10 sec. After the alerting event, we asked them for evaluating each device from the viewpoint of easiness to aware in five ranks (5 is "good" and 1 is "bad"). Table 1 shows an evaluation result. The subjects A to F are university students, and G is a subject in her 60's. The subject G did not notice the beep sound, so the rate is nothing. Most subjects have difficulties for noticing the LED because the system originally used a single LED light. We changed it to an array of LEDs and implemented three scale gradation display function according to the WBGT value as shown in Figure 2(b). Although the other three devices got relatively good rates above four, the vibration was a lowest among them. Some subjects indicated that the vibration should be more effective if it directly stimulates the user's skin. Then, we also changed it from the stationary-type to the bracelet-type vibrator as shown in Figure 2(b).

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Then, we brought the system to the 80's subject's residence and conducted the main test as shown in Figure 2(c). We requested the subject to use the system with and without improvements in the same manner as the preliminary test and checked to see the improvements are adequate. The result using the pre-improvement system got the similar scores in the preliminary test (LED and vibration were relatively low rates). In the test with the post-improvement system, the subject gave the highest score (5) in all devices. While we acquired positive messages from the subject, she also mentioned the difficulty to judge true usefulness of the system. We, therefore, need further experiments for the elderly with different physical conditions to enhance the customization function.

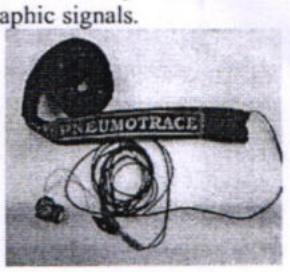
Table 1. Easiness to aware for output devices in the preliminary test.

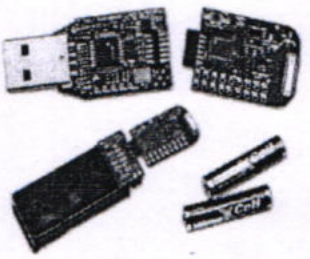
	A	B	C	D	E	F	G	Ave
LED	1	1	1	1	1	1	1	1
Beep sound	3	5	4	5	5	5	-	4.5
Vibration	3	4	3	5	3	5	5	4.0
Voice	4	4	5	5	5	5	5	4.7

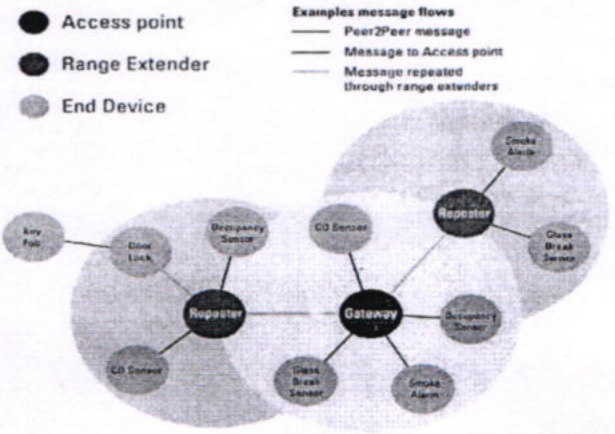
-G: subject IDs, Ave: average value

Easiness in five ranks (5: good - 3: neutral - 1: bad)

The WBAN is built by using custom developed and available commercially devices for the acquisition of biomedical signals and a wireless development kit (evaluation module eZ430-RF2500 from Texas Instruments) for wireless communication. The eZ430-RF2500 kit uses the low power MSP430F2274 16bit microcontroller (from Texas Instruments), that provides all necessary parts (HW and SW) for the 16-bit MSP430F2274 microcontroller and CC2500 radio transceiver (from Chipcon). The transceiver operates on the 2.4 GHz and provides the support for wireless data transmission with low-power energy. It also provides the support for power supply management, is interfaced to the microcontroller by using the high speed serial interface, and has 25/100m range indoor/outdoor (Fig. 2) Based on the system architecture illustrated in Fig. 1 we have developed a prototype of a WBAN of devices for physiological parameters measurement. For SpO2 and HR measurements we used a commercially available AFE44x0SPO2EVM (from Texas Instruments – Fig. 3). The device is intended for evaluating AFE4400 chip, designed to be used in the development of medical devices for the acquisition and processing of the photoplethysmographic signals.







Respiratory rhythm measurement has been performed by using a commercially available piezoelectric respiratory transducer, PNEUMOTRACE (from UFI), attached around the patient's thorax. It generates an electrical signal in response to the modification in thoracic circumference due to patient respiration (Fig. 4). More details about the wireless device can be found in [7]. For body temperature measurements, we used a specialized temperature sensor (TMP275 from Texas Instruments) directly connected to the eZ430-RF2500 development kit by using the serial interface (Fig. 5). The TMP275 is a 12-bit 220ms temperature sensor capable to measure with 0.5°C accuracy, with a resolution of 0.0625°C. The accuracy of the TMP275 temperature sensor for the range between 35-45°C is below ±0.2°C, making it suitable for medical temperature measurements. More details about the body temperature device can be found in [12].

As wireless network protocol, SimpliciTI supports End Devices in a peer-to-peer network topology, an Access Point as a network coordinator to store and forward the measured temperature to the PC, and Range Extenders used to extend the range of the wireless network.

IV. CONCLUSIONS

We proposed a method for monitoring and detecting risky conditions of heat stroke and effectively warning the occurrences to the elderly through multi-sensory information notification. We implemented the system based on the proposed method and observed some effects in experiments. We would like to further evaluate the system by employing larger number of subjects with various conditions and requirements in the near future.

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A Survey on Water Quality Analysis for Industrial Application under IOT Environment

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Abstract— **Internet of Things (IoT) is global network of "smart device" that can sense and interrelate with their environment using the internet for their communication and interaction with users and other systems. The traditional method of testing Turbidity, PH & Temperature is to collect samples manually and then send them to laboratory for analysis. However, it has been unable to meet the demands of water quality monitoring today. By manually monitoring the water quality is very time consuming as well as its complicated to get water parameter in real time. To overcome this a set of Monitoring of Turbidity, PH & Temperature of Water quality are going to be placed in the reservoir as the variations in these parameter will get to know the presence of pollutants. In this paper a new approach has been adopted to analyze the quality of the water under IoT environment. The proposed system contains data acquisitions node, controlling unit as ARM, base station and monitoring unit, where all these units are connected to each other .Data can be collected from various sensor and each sensors has its own way to read the data about physical phenomenon ,so necessity to write diverse code for each sensor for data collection procedures. Meanwhile to control and to do some pre-processing work MCU unit has been adopted, after data collection from various sensor such as its Temperature, Turbidity, PH, etc at base station is sent to display on monitoring node and also compared with standard values .By continually monitoring water quality people get awareness locality water condition so we can minimize its critical effect on human life ,filed, animals etc with high frequency.**

Key Words--- **Internet of things (IoT), WSN, MCU, Communication standards, Temperature sensor, level sensor, Turbidity sensor.**

I. INTRODUCTION

At present situation we all are facing global warming the main reason for global warming is pollution which may be water pollution or environment pollution this critical issue can be avoided by protecting environment. Meanwhile water pollution is major task which we are numerously facing now days. Water get polluted due to industrial wastages, or due disaster or by humans. This paper presented different technologies, parameters to analyze the water quality. In which IOT is being considered as a technological invention which provides a worldwide network to interconnect objects and its advancement depends on a various new technologies, like WSN, cloud computing and information sensing [4]. As given below figure 1 IOT architecture consist three layer in which combined with sensing objects, integration part and number of sensor nodes, modelling techniques, communication protocols, security and privacy[9].

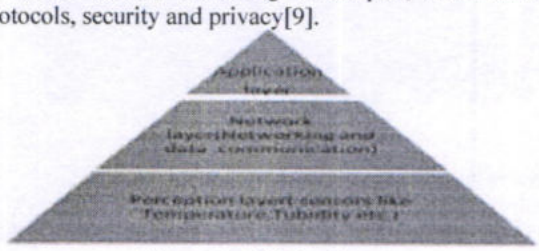

Figure 1: IoT Architecture

Wireless sensor networks (WSN) are widely used in various kinds of application to sense and collect data about physical things for get better understanding. Monitoring system is depends on wireless sensor conception which contains sensor nodes, clustering ,sink node and has a limited power source to conquer this they were extended network lifetime by dynamic power management and scheduled switching mode protocol[11].

End node of IOT frequently transmit the sensed data from cluster node to server ,whereas to analyze redundant data ,duplicate reading and how efficiently data can acquire, transmit , store among several source node is remain a difficult task.

II.PROPOSED SYSTEM

For current scenarios monitoring the polluted water resources is essential need to avoid major effect on human life, filed, industrial application ,to mitigate and monitor critical situation from contaminated water we propose a new design which is includes interface device to collect data effectively from diverse sensor and MCU for controlling the entire operation and for some pre-processing .

Thus the performance analysis has been conducted and adequate effects is carried out on water reservoir monitoring for industrial application by detecting the value from temperature sensor, level sensor turbidity sensor, we can minimize the censorious stages for industrial water

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reservoir monitoring for industrial application using IOT .Water gets polluted in many ways like industrial wastages, due to disaster, or human being. So people need to get the awareness locality of water condition. To achieve this prototype block diagram is approached below in figure2.

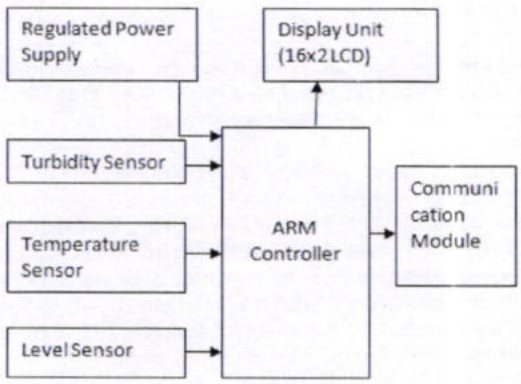

Figure 2: System's hardware block diagram

III.MAJOR PARAMETER DESCRIPTION USED IN SYSTEM'S HARDWARE

3.1 Interfacing device

Sensor interface device term is applied to a device, which contains number of sensors with an ability of processing, integrating the collected data and then transmit together ether wired based or wireless. Generally device has restriction about sensor data type, its sampling rate, and make device smart each sensor need complicate program code to sense data for physical phenomenon. In a proposed hardware system ARM is used as a core controller in data acquisition interface device and it is 32-bit controller with three stage pipeline (Fetch, decode and execute), in which von-Neumann architecture is adopted. This controller is easy to implement, low power consumption and has a low price.

3.2 Level sensor

Magnetic float sensor like on / off switch which helps to sense the level of water present in the overhead tank or sump. The tank, the switch gets activated by the magnet in the float, thereby the signal which is obtained from the sensors have a permanent magnet in the float. The Switch is present in the white stem of the sensor. As the float rises or falls with level of water in sensors is used along with the water level indicator.

Specifications:
Level measurement type – High/ low.
Switching capacity – 10W
Switching voltage – 0.5 Amp.max.
Switching voltage – 25v DC max.
Cable – two cores

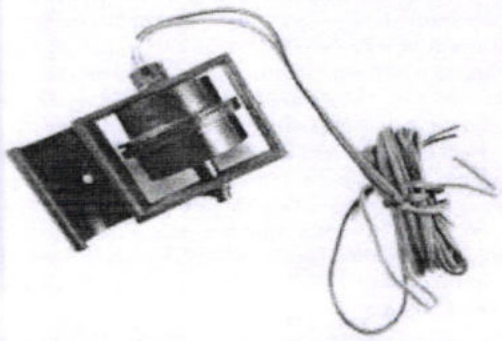

Figure 3: Magnetic float sensor

3.3 Display unit

LCD (Liquid crystal display) unit is widely used in many more application. LCDs are more emerging in nature which are easily programmable and no limitation to display special symbols & characters (unlike in seven segments), animations and so on. A 16x2 LCD means there are 2 lines in that it can display 16 characters per line. In LCD display unit each character is displayed in 5x7 pixel matrix. LCD contains two registers i.e. Command and Data. Command has to be given to initialize LCD as well to do some predefine work like clearing, setting cursor on screen, controlling etc. displayed data has to store in data register.

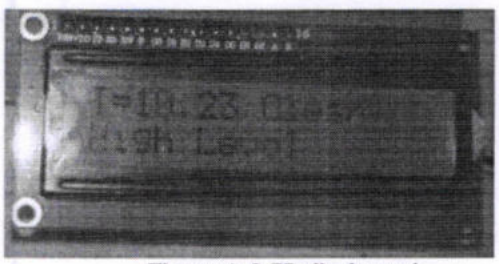

Figure 4: LCD display unit

3.4 Turbidity sensor

Turbidity sensor (TSD-10 Module) is use detect and measure the suspended particles i.e. turbidity in water, due

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to this it will effect on Fields, living organism etc. suspended particles can be measured by using an optical transistor and optical diodes, an optical sensor measures the amount of light coming from the source of the light to the light receiver, in order to calculate water turbidity.

Specifications:

Module Number - TSD-10.
Related voltage - DC 5v.
Voltage difference - 3.0±10%
Related current- max 30mA

Figure 5: Turbidity sensor

IV.WATER RESERVOIR MONITORING HARDWARE PHYSICAL MAP WITH EXPERIMENTAL RESULT

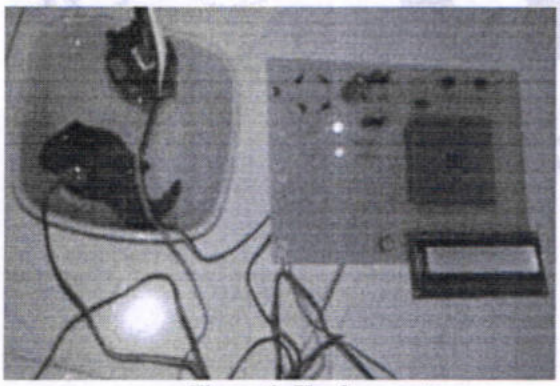

Figure 6: Hardware setup

V. CONCLUSION

Now-a-day's water get polluted by many ways, so analyzing the quality of contaminated water is crucial part for industrial application, home, environment application etc. By monitoring the quality of the water resources we can avoid major effect on both human lives as well as on filed, which causes disease through contaminated water. To fix this critical issues the system has been proposed for water reservoir monitoring using IOT. Under this system MCU is used as a controller to do some specific as well as pre-processing task and data acquisition can be done in parallel way by detecting the temperature sensor value turbidity sensor and level sensor values. In this way we increase the quality of water and reduce its bad impacts.

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1	Vehicle health Monitoring system using CAN	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10363&issue=Issue5
2	Tracking down of projectile and robotic demolish	Shalini KV	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6392&issue=Issue11
3	Survey on detecting Malcious facebook application	M.Sheeladevi	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6400&issue=Issue11
4	Study on Improved Performance Modeling Message Dissemination in VANET Using DSRC	M.Sheeladevi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6404&issue=Issue11

5	Stock Conservation	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10349&issue=Issue5
6	Spruceness in City Roads	T.K Pradeep Kumar	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6401&issue=Issue11
7	Speech Enhancement of alt Speech using Spectral Subtraction and template Matching	D.A.Vennila	EEE	Journal of Chemical & Parametric Science	2016-17	ISSN: 0974-2115	https://www.jchps.com/specialissues/2017%20Special%20Issue%2011/EC1755.pdf
8	Solar Based E – Uniform for Soldiers	Myneni Chandana	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10350&issue=Issue5
9	Smart Power Gen Using Renewable Sources With Intelligent Energy Storage System In Grid	K RAMYA	EEE	International Journal For Research In Applied Science & Engineering Technology (IJRASET)	2016-17	ISSN: 2321-9653	https://pdfs.semanticscholar.org/a24e/251af941078d08a1a23a4000e30f24a8ef2c.pdf

10	Smart phone operated wheel chair using voice and body gesture	Manjula G	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6394
11	Smart home security through NFC	Rejithomas	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://ijercse.com/abstract.php?id=6391&issue=Issue11
12	Smart guide extension for Blind cane	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6402&issue=Issue11
13	Smart Farming using Arduion Technology	S Jeyadevan	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6395&issue=Issue11
14	Smart controller fed non Conventional Microgrid for Optimal Power distribution	Lorate Shiny	Computer Science and Engineering	Science Direct - Elsevier publication	2016-17	ISSN:2214-7853	https://www.sciencedirect.com/science/article/pii/S2214785317324707

15	Smart bus	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i3/39.pdf
16	Sanjeevvani Drone	Raghavendra Rao	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERECE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10353&issue=Issue5
17	Rising data availabity in cloud using graining concepts	Raghavendra Rao	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=739
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19	Public water supply grid monitoring to avoid tampering and water man fraud using IOT	Lorate Shiny	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10341&issue=Issue5

20	Peristaltic flow of a Newtonian fluid in an inclined channel under the effect of Hall Current	Dr.P.Gangavathi	Mathematics	IJSEM	2016-17	ISSN 2394-2320	https://www.technoarete.org/common_abstract/pdf/IJSEM/v4/i5/Ext_54396.pdf
21	Mobile Applications In Context of Big Data A survey	M.Sheeladevi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i3/35.pdf
22	Misbehaving Node Detection using Secure Acknowledgement in MANET	Manjula G	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10357&issue=Issue5
23	Li-Fi The future Technology in Wireless Communication	Raghavendra Rao	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://www.journal.bonfring.org/papers/sesc/volume6/BIJ-8241.pdf
24	Intelligent fire extenguisher system	Sharon Roji Priya	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10355&issue=Issue5
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27	Glide player	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10340&issue=Issue5
28	Future aspects and key challenges of IOT	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10362&issue=Issue5
29	Energy Saving Through Smart Home	Rejithomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6397&issue=Issue11
30	Encryption protocol for securing MANET-L to S	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10360&issue=Issue5

31	E-Bin for waste segregation	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10352&issue=Issue5
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33	Digital Forensics,Cyber Crime and Datamining	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6409&issue=Issue11
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36	Crawler Bot	Shalini KV	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10339&issue=Issue5
37	Brain to Brain communication	Reji Thomas	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6393&issue=Issue11
38	Biometric Verification Using Face Recognition	P.Manikandan	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6398&issue=Issue11
39	Autonomous Agile Flying Robot (Quad rotor)	Dr.B Shadaksharappa	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6410&issue=Issue11

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42	Applying Intermittent energy distribution for evading energy holes in wireless sensor network	Sowmya AM	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=738
43	Android Speech Recognition Based Voice Command Notice Board	Manikandan	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10337&issue=Issue5
44	Andriod application on creating awareness on Illegal activities in Forest	Lorate Shiny	Computer Science and Engineering	Bonfring IJSEand SC	2016-17	ISSN:2277-5099	http://journal.bonfring.org/abstract.php?id=7&archiveid=687

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47	A survey of Routing protocols in Moblie Adhoc networks	Sheela Devi	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10358&issue=Issue5
48	A Futuristic Approach For Towerless Mobile Networks	P.Kalamani	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6405&issue=Issue11

49	An Efficient Approach to Reduce Network Partitioning Using AMMNET	G.manjula	Computer Science and Engineering	International journal of Advanced research in Computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=6389&issue=Issue11
50	Agribot-"Future Farmer's Friend"	Santhi Priya	Computer Science and Engineering	International Journal of Engineering research in computer science & engineering(IJERCSE)	2016-17	ISSN:2394-2320	http://ijercse.com/abstract.php?id=10338&issue=Issue5

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Vehicle Health Monitoring System Using CAN

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Abstract— **Due to multiple connections of data & electrical lines connected to microcontroller it becomes very complex to understand & troubleshoot it. It also restricts us long distance data transfer due to large number of lines. To minimize all these problems, we can use "CAN" protocol to connect these entire network.CAN (control area network) enable us to connect all the devices together using only two wires. Due to this, the numberof lines connected to microcontroller reduces greatly & circuitry becomes simple to understand & troubleshoot. UsingCAN protocol we have connected multiple microcontrollers & other devices to a common can bus like light sensor,temperature& ultrasonic sensor.**

Keywords:-CAN, PIC, PS, PCB, IC

I. INTRODUCTION

Present Automobiles are being developed by more of electrical parts for efficient operation. In case of microcontrollers as we know it's a central controlling unit and all the other devices or circuitries connected to it. Due to multiple connections of data and electrical lines connected to microcontrollers, it becomes very complex to understand and troubleshoot it. This project presents the development and implementation of a digital driving system for a semi-autonomous vehicle to improve driver vehicle interface .The communication module use in this project is embedded networking by CAN which has efficient data transfer. Using CAN protocol we can connect multiple microcontroller and other devices to a common CAN bus. To connect it to CAN bus we require a CAN transceiver in between bus and devices which enables the communication between all thing with great speed and priority.

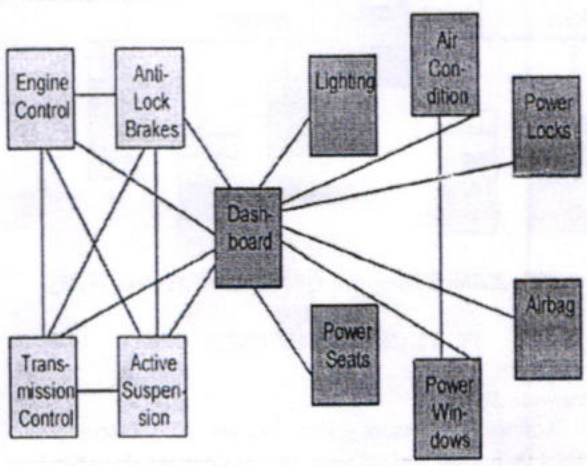
This project also presents the development of distance measurement using ultrasonic sensors which denotes the vehicle's position from obstacles. It is important that human drivers still have some control over the vehicle. This project is aimed at the implementation of CAN protocol using PIC for ehicle monitoring system. The main feature of the system includes monitoring of various vehicle parameters such asTemperature, presence of CO level in the exhaust, Battery Voltage and Light due to spark or fire. The software part is done in Mikro C using embedded C.

II. RELATED WORKS

A .Existing System

Fig.1 Block Diagram Of Existing System(Without CAN)

To improve the working of vehicle further, it is necessary to control overall system to exchange information. In existing system this is done using discrete interconnections of different systems means by using point to point wiring. For information exchange up to several miles length of cable network becomes very large and it increases connectors. This produces growing problems along with material cost, production time.



B. Need of CAN

- CAN is mature standard
- CAN protocol more than 16 years
- Numerous CAN products and tools on the object
- Hardware implementation of the protocol
- CAN Bus used for the combination of error handling and fault confinement wit high transmissionspeed(up to 1Mbps)
- Simple transmission medium
- Twisted pair of is the standard, but also just one wire will work
- Other links works, too: Opto – or radio links
- Excellent error handling
- Fault confinement
- High speed, real time communication
- Provide noise immunity in an electrically noisy environment

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Tracking down of Projectile and Robotic Demolish Scheme

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Abstract: -- **System is designed to detect the projectile (missile) moving in multiple directions. The robotic demolish system moves automatically in direction of the missile and fires it upon fixing the target. An ultrasonic module interfaced to a microcontroller of 8051 family is used in this system. An ultrasonic transducer comprising of transmitter and receiver are used. Transmitted waves are reflected back and received by the transducer. By taking into consideration the velocity of sound, the total time taken from sending waves till it is received is calculated. The distance is measured by the program on the microcontroller and displayed on LCD screen interfaced to the microcontroller through Zigbee wireless communication. The circuit will receive the reflected signals of 40KHz from the missile object, and it is fed to a program of microcontroller. As soon as the microcontroller gets the signal from the ultrasonic receiver it activates the door gun by triggering the gate of MOSFET through the transistor or relay. The sensor is rotated and controlled by stepper motor through 360 degrees. In case if there is any target within the detection range the application will turn the launcher to the nearest detected target and fires.**

Keywords:-- **Microcontroller, Ultrasonic transducer, Zigbee, Stepper motor, DC gear motor.**

I. INTRODUCTION

The proposed system uses an ultrasonic module interfaced to 8051family microcontroller to detect missile object. An ultrasonic transducer comprising of a transmitter and receiver are used on same module. The ultrasonic transducer produces sound waves. The transmitted sound waves are reflected back from the object and received by the transducer again. The total time taken from sending the waves to receiving it is calculated by taking into consideration the velocity of sound. Then the distance is measured and displayed on a liquid crystal display interfaced to the microcontroller.

When the microcontroller receives the signal from ultrasonic receiver, it activates the door gun by triggering the gate of MOSFET through a transistor or relay. The sensor is fitted on antenna and is rotated and controlled by stepper motor through 360 degrees. If there is any target within the detection range, the application will turn the launcher to the nearest detected target and fires.

The antenna is rotated and controlled by stepper motor by one axis and also with another axis it rotates up and down directions towards missile object simultaneously. The tank vehicle is fitted with another microcontroller for movements of the vehicle's control actions send and receive by the key panel through wireless Zigbee communication. The programs for 8051 family microcontroller are written by the embedded C programming using Kiel software.

II. ARCHITECTURE OF PROPOSED SYSTEM

The architecture of proposed system is consists of 8-bit microcontrollers AT89C51and P89V51RD2, Zigbee wireless communication module, Ultrasonic Transducer module, Stepper motor drive module, geared DC motor drive module, LCD interfaces module and other necessary accessories. These are explained in subsections.

2.1 Microcontrollers

The missile detection and automatic destroyer system using 8-bit microcontrollers are shown in Figure1 Fig. 2. The AT89C51 is a low-power, high-performance CMOS 8- bit microcomputer with 4K bytes of Flash programmable and erasable read only memory

The table 1 is gives the experimental manual tested results and its successful operations.

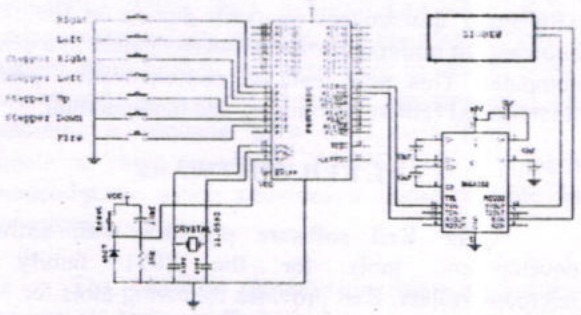

Fig. 7: Wireless Key pad controller with Zigbee interface

V. CONCLUSION

The Ultrasonic transceiver (Transmitter & Receiver) detects missile object and displays distance on LCD through Microcontroller based Zigbee wireless communication standard. The sensor is fitted on antenna and is rotated and controlled by stepper motor through 360 degrees and also with up and down directions. If there is any target within the detection range, the application will turn the launcher to the nearest detected target and fires. The tank vehicle is fitted with another microcontroller with movements of the vehicle's control actions send and receive by the Zigbee communication key panel. The launching system can be modified to aim at missile object in three axis rotation by following the Ultrasonic transceiver data.

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Survey on Detecting Malicious Facebook Applications

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Abstract: -- **The popularity and addictiveness of Facebook is due to existence of the third-party apps as there are installations of nearly 20 million per day.Due to which, malware and spam are easy to spread since there is a potential use of these apps which has been identified by hackers. The problem is already weighty as we find that at least 13% of applications in our dataset are malevolent.There has been focus by the research community to detect malicious posts as well as campaigns.Our major contribution lies in developing FRAppE—Facebook's Rigorous Application Evaluator which is arguably the first tool focused on detecting malicious apps on Facebook. To develop FRAppE, we make use of information gathered by closely observing the posting behaviour of 111K Facebook apps seen across 2.2 million users on Facebook. First, we identify a set of features that helps us to differentiate between malign apps and kind apps. For example, we find that malicious apps often share names with other apps, and they commonly request fewer permissions than kind apps Second, leveraging these distinguishing features, we show that FRAppE can detect malicious apps with 99.5% accuracy, with no false positives and a high true positive rate (95.9%).Finally, we examine the ecosystem of malicious Facebook apps and recognize methods that these apps use to multiply. Interestingly ,we find that many apps conspire and support each other; in our dataset, we find 1584 apps enabling the viral multiplication of 3723 other apps through their posts. In long term measures, we identify FRAppE as a step towards creating an independent watchdog for app ranking & assessment, so as to make Facebook users aware before installing apps.**

I. INTRODUCTION

Background

We discuss how applications work on Facebook, and we outline the datasets that we use in this paper.

A. Facebook Apps

Facebook provides services toits users by means of Facebook applications. Not similar to conventional desktop and smartphone applications, installation of a Facebook application by a user does not involve the user downloading and executing an application binary. Instead, when a user adds a Facebook application to his/her profile, the user grants the application

Server performs following things:

1) Permissions to access a piece of information listed on the user's Facebook profile (e.g., e-mail address).

2) Permissions to execute particular actions on behalf of the user (e.g., ability to post on the user's wall).

These permissions to any application are granted by the Facebook for each user who installs the application by handing an O Auth 2.0 token to the application server. After that, the data can be accessed by the application and perform the actions on behalf

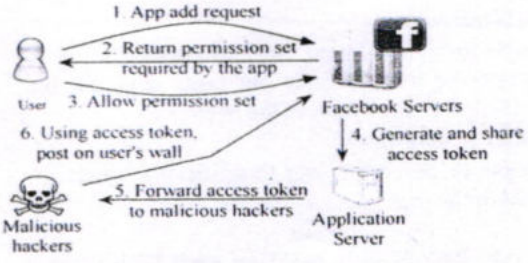

Fig. 1. Steps involved in hackers using malicious applications to get access tokens to post malicious content on victims' walls of the user which are permitted to be done in an explicit manner. Fig. 1 depicts the steps involved in the installation and operation of a Facebook application.

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Operation of Malicious Applications:

Facebook applications which are malicious commonly tend to operate as follows:

- Step 1: Users are persuaded, usually with some
- fake promises ,to install the app by hacker.
- Step 2: Once the app has been installed by the user, it redirects the user to a Web page where is request is made to the user to perform task such as completing a survey, again with the lure of fake rewards.
- Step 3: The personal information from the user's profile is then easily accessed by the application which in turn leads the hackers to make profit out of it in a potential manner.
- Step 4: The app makes malicious posts on behalf of the user to lure the user & convince his/her friends to install the same app.

The rotation continues with the app or conspiring app searching more and more users. Surveys or personal information can be sold to third parties to eventually profit the hackers.

B. Our Datasets

The base of our research is a dataset which is obtained from 2.2M active Facebook users, who are constantly monitored by My Page Keeper, our security application for Facebook. My Page Keeper evaluates every URL that it encounters on any user's wall or news feed to determine if that URL leads to social spam. My Page Keeper classifies a URL as social spam if it leads to a Web page that:

1) Spreads malware;
2) Attempts to "phish" for personal information;
3) Requests the user to carry out tasks (e.g., fill out surveys)that profit the owner of the Web site;
4) Promises false rewards;
5) Attempts to entice the user to artificially inflate the reputation of the page;

My Page Keeper evaluates each URL using a machine-learning-based classifier that leverages the social context attached with the URL. For any particular URL, the features used by the classifier are obtained by uniting information from all posts (seen across users) containing that URL.

Example features used by My Page Keeper's classifier include the likeness of text message across posts and the numbers of comments or Likes on those particular posts. My Page Keeper has false positive and false negative rates of 0.005% and 3%. Our dataset includes 91 million posts from 2.2 million walls constantly monitored by My Page Keeper over 9 months from June 2011 to Note that Facebook has deprecated the app directory in 2011, therefore there is no central directory available for the entire list of Facebook apps [19].

Table I
Summary of the dataset collected by mypagekeeper From june 2011 to march 2012

Dataset Name	# of apps	
	Benign	Malicious
D-Total	111,167	
D-Sample	6,273	6,273
D-Summary	6,067	2,528
D-Inst	2,257	491
D-ProfileFeed	6,063	3,227
D-Complete	2,255	487

Table II
Top malicious apps in d-sampe dataset

App ID	App name	Post count
235597333185870	What Does Your Name Mean?	1006
159474410806928	Free Phone Calls	793
233344430035859	The App	564
296128667112382	WhosStalking?	434
142293182524011	FarmVile	210

The D-Sample Dataset:
Finding Malicious Applications:

To recognize malicious Facebook applications in our dataset, we start with a simple strategy: If any post made by an application was flagged as malicious by MyPageKeeper, we mark the applicationas malicious. By applying this strategy, we identified 6350 malicious apps. Interestingly, we discover that many popular applications such as Facebook for Android were also marked as malicious in this process. This is in fact the outcome of hackers exploiting Facebook weaknesses. To avoid such misclassifications, we verify appsusing a white-list that is created by taking into consideration the most popular

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apps and important manual effort. After white-listing, we are left with 6273 malicious applications (D Sample datasetin Table I). Table II shows the top five malicious applications, in terms of number of posts per application.

Although we conclude the ground truth data about malicious applications from MyPageKeeper, it is possible that MyPageKeeper itself has potential inclination classifying malicious app's posts. For example, if a malevolent application is not so much popular and therefore does not appearin many users' walls or news feeds, MyPageKeeper mayfail to classify it as malicious (since it works on post level). However, as we show here later, our proposed system uses a different set of features than MyPageKeeper and can identify even very unpopular apps with high accuracy and low false positives and false negatives.

Fig. 2 shows the number of new malicious apps seen in every month of the D-Sample dataset. For every malicious app in the D-Sample dataset, we consider the time at which we observed the first post made by this app as the time at which the app was launched. We identify that hackers launch new malignant apps every month in Facebook, although September 2011, January 2012, and February 2012 see significantly higher new malicious app activity than other months. Out of the 798 malicious apps launched in September 2011, we find 355 apps all created with the name "The App" and 116 apps created with the name "Profile Viewing." Similarly, of the 3813 malicious apps created in February 2012, 985 and 589 apps have the name "Are You Ready" and "Pr0file Watcher," respectively. Other examples of

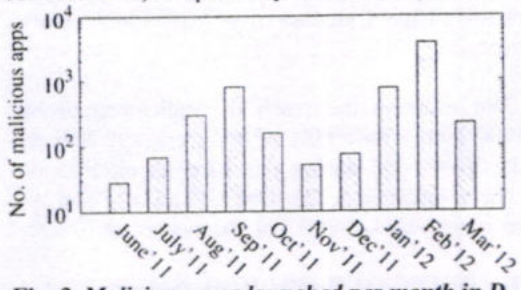

Fig. 2. Malicious apps launched per month in D-Sample dataset app names used often are:

"What does your name mean?," "FortuneTeller," "What is the sexiest thing about you?," and so on. D-Sample Dataset: Including Benign Applications:

To select an equal number of kind apps from the initial D-Total dataset,we use two criteria:

1) None of their posts were identified as malicious by MyPageKeeper
2) They are "vetted" by Social Bakers, which monitors the "social marketing success" ofapps.

This mechanism yields 5750 applications, 90% of which havea user rating of at least 3 out of 5 on Social Bakers. To match the number of malicious apps, we append the top 523 applications inD-Total (in terms of number of posts) and obtain a set of 6273 kind applications. The D-Sample dataset (Table I) is the unionof these 6273 benign applications with the 6273malicious applications obtained earlier. The most popular benign apps are FarmVille,Facebook for iPhone, Mobile, Facebook for Android,and Zoo World. For profiling apps, we collect the information for apps that is readily available through Facebook. We use a crawler basedon the Firefox browser instrumented with Selenium. From March to May 2012, we creep information for every application in our D-Sample dataset once every week. We collected app summaries and their permissions, which requires two different creeps.

D-Summary Dataset: Apps With App Summary:

We gather app summaries through the Facebook Open graph API, which is made available by Facebook at a URL of the form https://graph.facebook.com/App_ID. Facebook has a unique identifier foreach application. A summary of the app possesses several subsets of information such as application name, description, company name, profile link, and monthly active users. If any application has been removed from Facebook, the query results in an error. We were able to collect the summary for 6067 benign and 2528 malicious apps (D-Summary dataset in Table I). It is easy to understand why malicious apps were more often removed fromFacebook.

D-Inst Dataset: App Permissions:

We also wish tostudy the permissions that apps request at the installation time. For every application App_ID, we crawl

https://www.facebook.com/apps/application.php?id=App

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_ID,which usually redirects to the application installation's URL.We were able to get the permission set for 487 maliciousand 2255 benign applications in our dataset. Automaticallycreeping the permissions for all apps is not trivial, asdifferent apps follow different redirection mechanisms, which areplanned for humans and not for creepers. As expected, here too thequeries for apps that are discarded from Facebook fail.

D-ProfileFeed Dataset: Posts on App Profiles:

Users canmake posts on the profile page of an app, which we can call the

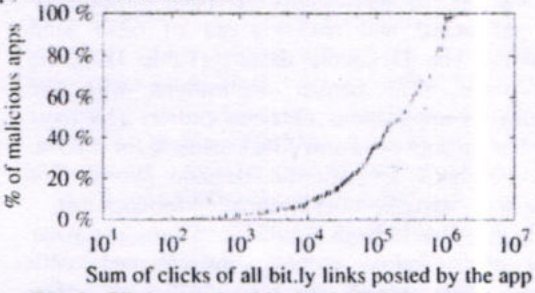

Fig. 3. Clicks received by bit.ly links posted by malicious apps.

profile feed of the app. We gather these posts using the Opengraph API from Facebook. The API returns posts appearing on the application's page, with several properties for eachpost, such as *message*, *link*, and *create time*. Of the apps inthe D-Sample dataset, we were able to get the posts for 6063benign and 3227 malicious apps. We construct the D-Complete dataset by taking the intersection of D-Summary, D-Inst, andD-ProfileFeed datasets.

II. PREVALENCE OF MALICIOUS APPS

The driving motivation for detecting malicious apps stems from the suspicion that a significant fraction of malicious post on Facebook are posted by apps.We find that 53% of malicious posts flagged byMyPageKeeper were posted by malicious apps.
We further quantify the prevalence of malicious apps in two different ways. 60% of malicious apps get at least a lakh clickson the URLs they post.

We quantify the reach of malicious appsby determining a lower bound on the number of clicks on thelinks included in malicious posts. For each malicious app in ourD-Sample dataset, we identify all *bit.ly* URLs in posts madeby that application.We focus on *bit.ly* URLs since bit.lyoffers an API for querying the number of clicks received byevery *bit.ly* link; thus, our estimate of the number of clicksreceived by every application is strictly a lower bound.

Across the posts made by the 6273 malicious apps in theD-Sample dataset, we found that 3805 of these apps had posted5700 *bit.ly* URLs in

Table III
Top five domains hosting malicious apps in d-insi dataset

Domains	Hosting # of malicious apps
thenamemeans3.com	34
fastfreeupdates.com	53
wikiworldmedia.com	82
technicalyard.com	96
thenamemeans2.com	138

total.We queried *bit.ly* for the clickcount of each URL. Fig. 4 shows the distribution across maliciousapps of the total number of clicks received by *bit.ly*links that they had posted. We see that 60% of malicious appswere able to accumulate over 100K clicks each, with 20%receiving more than 1M clicks each. The application with thehighest number of *bit.ly* clicks in this experiment—the "What is the sexiest thing about you?" app—received 1 742 359 clicks. Although it would be interesting to find the *bit.ly*click-through rate per user and per post, we do not have datafor the number of users who saw these links. We can query*bit.ly*'sAPI only for the number of clicks received by a link. 40% of malicious apps have a median of at least 1000monthly active users.

We examine the reach of malicious appsby atleast 1000 users, while 60% of malicious applications achievedat least 1000 during the 3-month observation period. The topmalicious app here—"Future Teller"—had a maximum MAU of 260 000 and median of 20 000.

III. DETECTING MALICIOUS APPS

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Features	Source
Is category specified?	http://graph.facebook.com/appID
Is company name specified?	http://graph.facebook.com/appID
Is description specified?	http://graph.facebook.com/appID
Any posts in app profile page?	https://graph.facebook.com/AppID/feed?access_token=
Number of permissions required	https://www.facebook.com/apps/application.php?id=AppID
Is client ID different from app ID?	https://www.facebook.com/apps/application.php?id=AppID
Domain reputation of redirect URI	https://www.facebook.com/apps/application.php?id=AppID and WOT

Now as we know the distinguishing characteristics inspecting the number of users that these applications had. To study this, we use the Monthly Active Users (MAU) metric provided by Facebook for every application. The number of Monthly Active Users is a measure of how many unique usersare engaged with the application over the last 30 days in activitiessuch as installing, posting, and liking the app. Fig. 4 plotsthe distribution of Monthly Active Users of the maliciousapps in our D-Summary dataset.For each app, the median and of both malicious and benign apps, we next use these facilities to develop proper classification techniques to recognize malevolent Facebook applications.We present two variants of our malicious app classifier— FRAppELite and FRAppE.

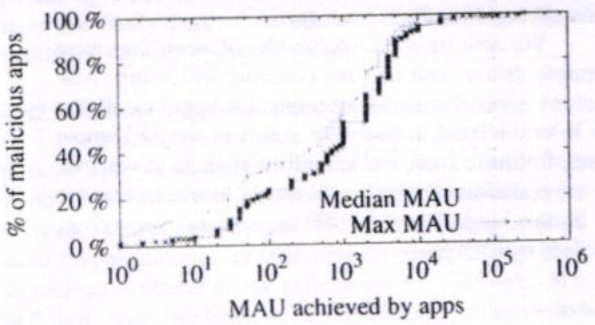

Fig. 4.Median and maximum MAU achieved by malicious apps maximum MAU values over the three months are shown. Wesee that 40% of malicious applications had a median MAU of

A. FRAppELite

FRAppELite is a lightweight version that makes use of only the application features available on demand. Given a specific app ID, FRAppELite creeps the on-demand features for that application and evaluates the application based on these featuresin real time. We visualize that FRAppELite can be incorporated, for example, into a browser extension that can evaluate any Facebook application at the time when a user is consideringinstalling it to his/her profile.

Table IV lists the features used as input to FRAppELite andthe source of each feature. All of these features are collectible on demand at the time of differentiation and do not require preknowledge about the app which is going to be evaluated.We use the Support Vector Machine (SVM) classifier for classifying malicious apps. SVM is widely used for binary classification in security and other disciplines. We usethe D-Complete dataset for training and testing the classifier. As shown earlier in Table I, the D-Complete dataset consists of 487malicious apps and 2255 benign apps. We use 5-fold cross validation on the D-Complete dataset fortraining and testing FRAppELite's classifier. In 5-fold cross validation, the dataset is randomly divided into five segments,and we test on each

Table V

Cross validation with frappe lite

Training Ratio	Accuracy	FP	TP
1:1	98.5%	0.6%	97.5%
4:1	99.0%	0.1%	95.3%
7:1	99.0%	0.1%	95.6%
10:1	99.5%	0.1%	94.5%

Table VI

Classification Accuracy With Individual Features

Feature	Accuracy	FP	TP
Category specified?	76.5%	45.8%	98.8%
Company specified?	72.1%	55.0%	99.2%
Description specified?	97.8%	3.3%	99.0%
Posts in profile?	96.9%	4.3%	98.1%
Client ID is same?	88.5%	1.0%	78.0%
WOT trust score	91.9%	13.4%	97.1%
Permission count	73.3%	49.3%	95.9%

Performance of the classifier. Accuracy is defined as the ratio of correctly identified apps (i.e., a benign/malicious app is appropriatelyidentified as benign/malicious) to the total number of apps. False positive rate is the fraction of benign apps incorrectly classifiedas malicious, and true positive rate is the fraction of benignand malicious apps correctly classified (i.e., as benign and malicious, respectively).

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Study on Improved Performance Modeling Message Dissemination in VANET Using DSRC

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Abstract: **-- Vehicular Ad Hoc Network applications plays an important role in improving the quality and efficiency of transportation system .To improve transportation safety vehicles exchange safety messages among them which helps to reduce accidents and chain collision. In the existing system flooding technique is used for broadcasting safety messages which leads to congestion when the traffic density increases and consequently packet loss occurs In this paper we propose an analytical model that helps to exchange Safety message with high performance by using intelligent routing protocol and congestion control mechanisms .By reducing the congestion ,reliability increases and delay decreases, consequently the performance of emergency message diffusion increases. The paper also proposes solutions to reduce the effect of hidden terminal problem in successful reception of packet in VANET .The model also proposes the ways to enable connectivity in dense, sparse and isolated traffic condition.**

Keywords:- **Vehicular Ad-hoc Networks (VANET),Medium Access Control(MAC),IEEE802.11p,Dedicated Short Range Communication (DSRC).**

I. INTRODUCTION

VANET is a type of mobile ad-hoc network in which the vehicles communicate with each other to form Intelligent Transportation System. This type of wireless communication allows both vehicle -vehicle communication (IVC) and vehicles to infrastructure (V2I) communication , for exchanging safety and status messages between the vehicles to reduce the number of accidents and chain collision.

Vehicles are equipped with sensors and GPS system which collects information about their position, speed and direction to be broadcasted to all vehicles with in their range. The main objective is to improve safety on road and save people from accidents in harsh vehicular environment by exchanging safety related messages among the vehicles. Vehicles basically exchange two types of messages, ie., emergency and status messages.

The status message gives state information such as speed, acceleration and position of each vehicle. The status messages are sent periodically to all the vehicles and it can also be called as beacon messages. The emergency message gives pre-crash notification message, post-crash notification , environment and road hazards .The paper mainly focus on emergency message dissemination between the vehicles. VANET uses Dedicated Short Communication Spectrum (DSRC) at 5.9 GHz for vehicle and vehicle to infrastructure communication as shown in the Fig 1.

Either radio interface or On-Board unit is used to enable short-range wireless networks to be formed. Vehicles switch between control channel and service channel so that safety related messages will not be missed. In this paper MAC protocol is used that supports high mobility and distributed channel access. Two types of MAC protocols are : IEEE 802.11 and ADHOC-MAC .Since IEEE 802.11 does not need time synchronization and its support towards network allocation vector that senses virtual carrier to solve hidden terminal problem ,we highly recommend it in VANET .But IEEE 802.11 broadcasting mode do not use Request-to-send/Clear-to-send(RTS/CTS) handshaking process which reduces the reliability considerably. Hence, we use IEEE 802.11p WAVE which is group of standards related to DSRC based operations that enables efficient communication by reducing the connection set up overhead. Road side Unit is an access point that is laid on road side to provide long range connectivity.

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Qualitative Comparison Of Aodv And Olsr Protocols In Vanet

SNo	Evaluation Metrics	AODV	OLSR
1	Type	Reactive	Proactive
2	Scheme	Distance vector	Link state
3	QOS support	Yes	Yes
4	Message overhead	Low	High
5	End-to-end Delay	Average	Low
6	Packet delivery ratio	Average	Average
7	Routing overhead	Average	Average
8	Throughput	Average	High

V. CONCLUSION AND FUTURE WORK

Vehicular ad-hoc network is the emerging vehicle technology for Intelligent Transportation system that reduces number of accidents by exchanging safety message between the vehicles .As the reliability of safety message increases the performance increases dramatically .In this paper ,we proposed OLSR routing protocol that reduces number of retransmissions and hence increases QOS . Future work may include ways to improve QOS and enabling connectivity under isolated conditions.

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Stock Conservation

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Abstract— **The main aim of our project is to avoid the paper work done by maintaining the stock details like purchase, distribution and deployment of laboratories in an organization. When we carry out these we get lot of manual work and time consuming processes therefore there will be delay in supplying resources requires in laboratories and the works in laboratories also get slow.Delay happens because each and very stock purchase has to undergo process of verification from higher authorities.Confusion happens even for tracing out the location of the stocks.**

Keywords: **deployment, stock, location, laboratory**

I. INTRODUCTION

At present we record the details of stock manually in a record book.The details of stocks are as follows DOP(date of purchase), Invoice number, Order number, cost, unit price, quantity of purchase etc. To maintain these in the book and present it to the higher authorizes of organization is very difficult, consume lot of manual work and time in settling the stock in laboratories Therefore there is a vast delay in the set of laboratories. Sometimes it is hard trace out location of the stocks are deployed due loss of records, poor maintenance of record.

II. PROPOSED SYSTEM

The main aim of project is to manage the stocks without using the manual entry in books .WShen we record the details of deployment of components in the laboratories usually there will be lot of confusion among the user like how many deployed in one lab and how many are in working status. Even we cannot track how many components are sent for repair or replaced from particular laboratory, if it is deployed in the laboratories it will be difficult to trace out the location of the components. When we go to all these detail in paper work it will be time consuming to get approval from the concerned authority person and to solve the problem in laboratories. So to solve these problems our project gives relief and easy usage of recording and maintaining the stock details with their stages of purchase, deployment location, working status and repair status.

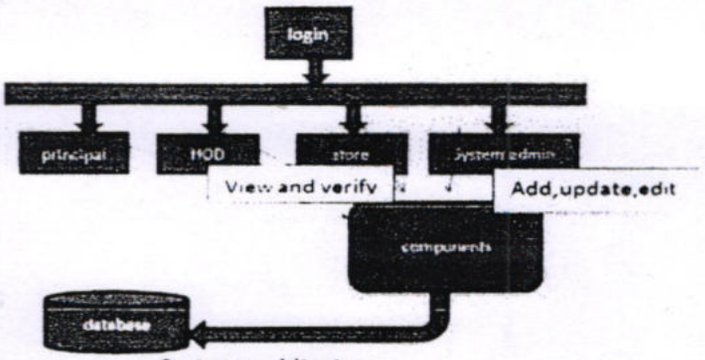
Therefore the Person who handle this job get easier and fast track is avail to the laboratory maintenance.

III. SOFTWARE ARCHITECTURE

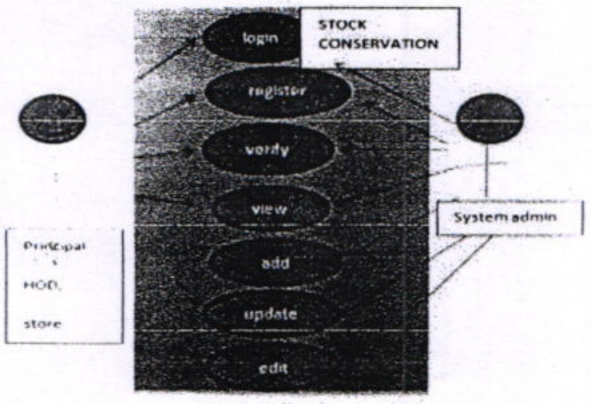
This software gives an easy usage of the stock maintenance . We used .net frame work in which developed our project using visual studio.

Principal, HOD, stores have only permission to view and verify the stock that has entered by the admin, the system architecture gives a detail description of how it works.System admin has full permission for update, add, editing, view and verify. Whenever a search is done the data is retrived from the table of component detail and get updated in the history table.

History



System architecture



Usecase diagram

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IV. SYSTEM REQUIREMENTS

Hardware requirement

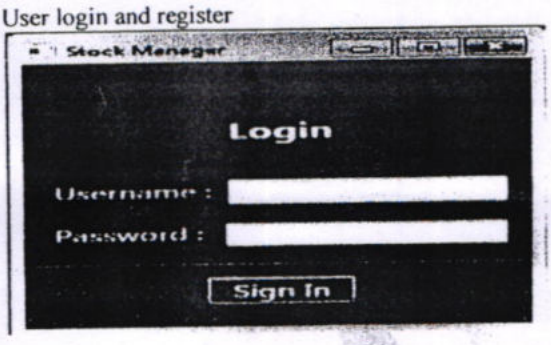
Processer :2GB
RAM :2GB
Hard disk :20GB

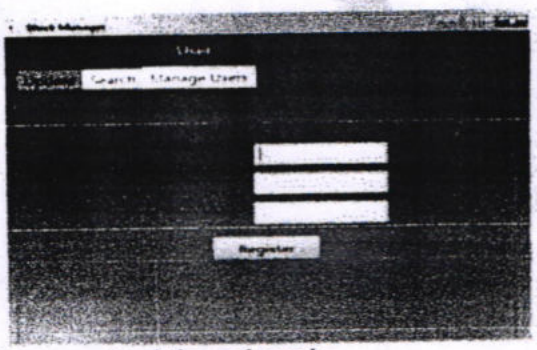
S/W System Configuration

Operating System : Windows 10/window XP
Front end :WPF
Framework: .net
Languages:C#,XAML

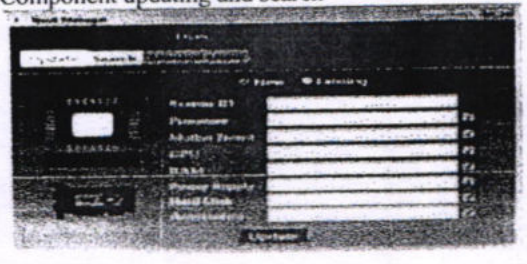
V. OUTPUTS

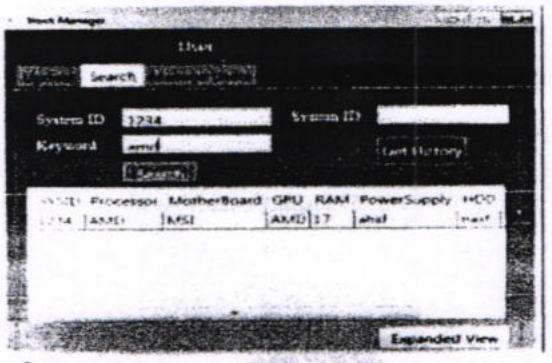
User login and register



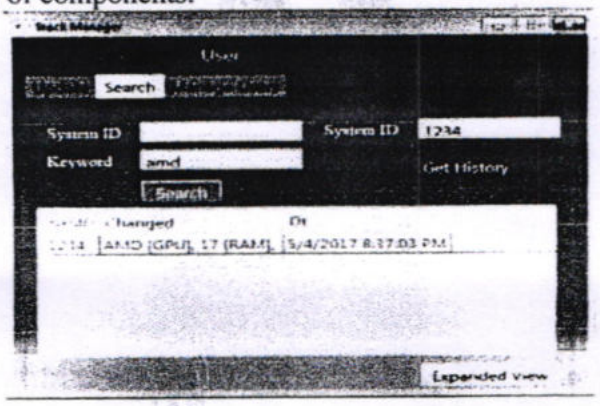


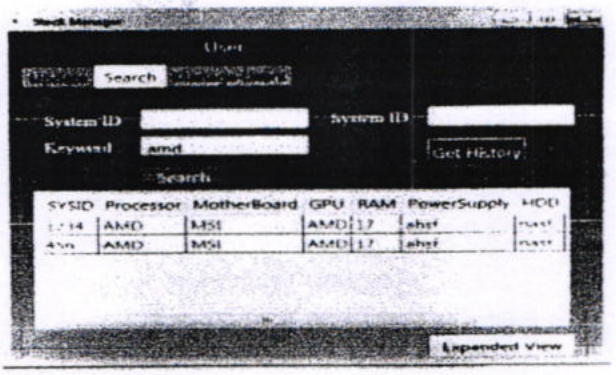
Component updating and search





History of components.





VI. ADVANTAGES

1.Easy retrieval of data from any location of components.
2.Status of components
3.User friendly
4.Facile conservation
5.Disrate the bufflements

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VII. CONCLUSION

This is facile software stands with all the aspects of the stock conservation ,its also satisfy the requirements of user with less efforts. Therefore we conclude that ,this software has benchmark in performance when compared to the existing system of stock conservation.

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Spruceness In City Roads

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Abstract: -- **This is an automated system which will be fitted in the Bus for cleaning the dust particle from environment.The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. In this system Microcontroller is the main unit, which controls the whole process. We are going to use AVR family microcontroller (ATMEGA 8/ ATMEGA 16). Vacuum Cleaner is used for cleaning the dust particle from road, which is connected with microcontroller. There is a container for containing the dust particle. We are going to use IR sensor for detecting the quantity of dust particle in container. IR sensor will be fitted on the top of container. When the container will be filled with dust container, then the sensor will detect it and send information to microcontroller. The sensor will be connected with Microcontroller .There will be one alert system for giving alert when the sensor will detect the quantity of dust. There will be one manual switch, which will be used for opening and closing of the container. Motors will be fitted on the top of container for opening and closing container.**

Keywords:-. **Manual Switch. Microcontroller. Container**

I. INTRODUCTION

The proposal aims at designing a unique system which can be controlled automatically for cleaning dust particle from road by using microcontroller, Vacuum cleaner and sensors. This proposal use to automatically clean of dust particle from road public means, where vacuum cleaner is present for sucking the dust particle from road and store it on a container. When Container will be filled, then the system will give alert. There will be one switch on the system for opening and closing the container. The system is automated process, which is controlled by microcontroller unit. Sensors are used for detecting and vacuum cleaner is used for sucking the dust particle. The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. We are using AVR family microcontroller (ATMEGA8/ATMEGA16), which controls the whole unit. To detect the quantity of container the IR sensor plays a major role. IR sensor is connected to microcontroller in order to send the alert signal Motor is fixed on the side of the container which helps it to open and close. Vacuum cleaner is an existing product.

II. LITERATURE SURVEY

According to the survey of 2015-2016, the number of peoples travelling in public means is around 50 lakh in Bengaluru city. For instance ,BMTC busses not only serves as public transport, but also provides its exclusive services to other organizations like IT companies ,Educational institutions, IT Tech parks, etc. Hence high percentage of people are dependent on BMTC.

III. EXISTING SYSTEM

1. Vacuum Cleaner.

A vacuum cleaner, also known as a sweeper, is a device that uses an air pump (a centrifugal fan in all but some of the very oldest models), to create a partial vacuum to suck up dust and dirt, usually from floors, and from other surfaces such as upholstery and draperies.

2. GPS tracking system.

A GPS tracking unit is a device, normally carried by a moving vehicle or person, that uses the Global Positioning System to determine and track its precise location. There are two types of GPS tracker system, car tracking system the data pullers and data pushers. The way these things operate are different but the end result is similar, you come to know where your car had been and where did it stop for how long, what

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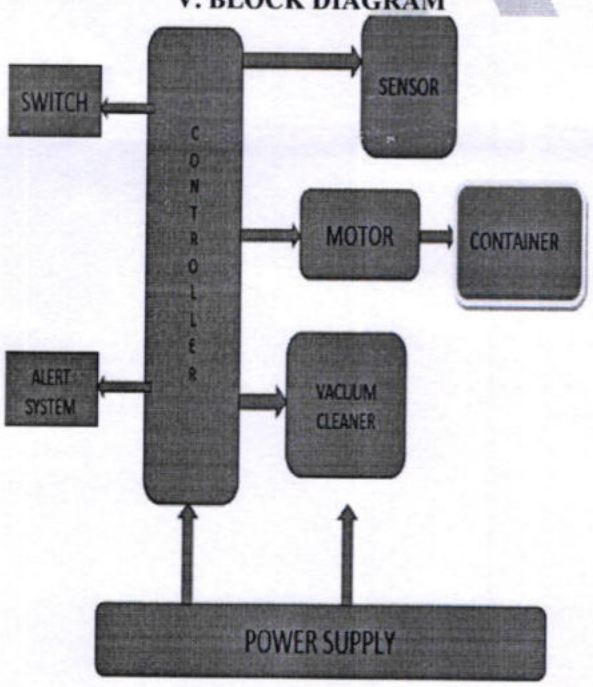
direction it took and how fast it drove, all the data from these car tracking system in India, GPS tracker systems in India like Delhi, Mumbai, Jaipur, Chennai, Bangalore and many more.

IV. PROPOSED SYSTEM

The system is designed for four wheeled Vehicles. The system is Fixed – Adjacent to the energy storage system. For power consumption we use battery.IR sensor is fitted on top of the container which senses and give signal to driver. The driver will dump the garbage in particular area. By this process we can keep the city roads clean. So 30% of our city can be kept clean. Even in rainy season , the sensor fixed in the container detects the wet particles. It sucks the both dry and wet particles. Using the kinetic energy produced by the vehicles energy can be generated and used for vacuum cleaner instead of using stored energy from the battery.

V. BLOCK DIAGRAM



VI. WORKING PRINCIPLE

Our proposed system consists of micro controller which controls the whole process. The system will be fitted on bus, where vacuum cleaner is present for sucking the dust particles from road sides and store it on a container. When container is filled, then the system will give alert signal to driver there will be one switch near to the driver for opening and closing the container. The system is an automated process, sensors are used for detecting and vacuum cleaner is used for sucking the dust particles. Here we use microcontroller-ATMEGA8/ATMEGA16, IR sensor, vacuum cleaner, beeper, power supply, flash programmer as hardware requirements and AVR studio, embedded C, MATLAB, sinaprog as software requirements AVR studio is the platform where we will write the code and compile the code for validation. Sinaprog is the platform in which we will jump our code from PC to microcontroller

6.1 Components Required

Fixed resistor-Resistor is a passive component used to control current in a circuit. Its resistance is given by the ratio of voltage applied across its terminals to the current passing through it. Thus a particular value of resistor, for fixed voltage, limits the current through it. They are omnipresent in electronic circuits. The different value of resistances are used to limit the currents or get the desired voltage drop according to the current-voltage rating of the device to be connected in the circuit. For example, if an LED of rating 2.3V and 6mA is to be connected with a supply of 5V, a voltage drop of 2.7V (5V-2.3V) and limiting current of 6mA is required. This can be achieved by providing a resistor of 450 connected in series with the LED.

Resistors can be either fixed or variable. The low power resistors are comparatively smaller in size than high power resistors. The resistance of a resistor can be estimated by their color codes or can be measured by a multi meter. There are some non linear resistors also whose resistance changes with temperature or light. Negative temperature coefficient (NTC), positive temperature coefficient (PTC) and light dependent resistor are some such resistors. These special resistors are commonly used as sensors. Capacitor- A capacitor is a passive two terminal electrical component used to store energy in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors separated by a dielectric (insulator); for example, one common construction consists of metal foils separated by a thin layer of insulating film.

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Capacitors are widely used as parts of electrical circuits in many common electrical devices. When there is a potential difference (voltage) across the conductors, a static electric field develops across the dielectric, causing positive charge to collect on one plate and negative charge on the other plate. Energy is stored in the electrostatic field. An ideal capacitor is characterized by a single constant value, capacitance, measured in farads. This is the ratio of the electric charge on each conductor to the potential difference between them. The capacitance is greatest when there is a narrow separation between large areas of conductor, hence capacitor conductors are often called "plates," referring to an early means of construction. In practice, the dielectric between the plates passes a small amount of leakage current and also has an electric field strength limit, resulting in a breakdown voltage.

Transistor - When we talk of transistor in robotics, we talk about the cut off and saturation region only, while in your course you study transistor in active region. So here I am talking about transistor as a switch. When we say transistor as a switch, we talk of cut off or not because the typical cut off Voltage is around 5V and the saturation voltage (vbe) is around 8V. There are regions between them. Let's start with transistor to glow an LED. Connect this circuit and see. Connect multi meter at the base of the transistor and see the voltage. In this circuit we can see that Ve =Vbe. For the transistor to be switched ON Ve=.5V. Vary the potentiometer to make Vbe=.5V, you can see that LED starts glowing(but it is less brightness).Vary the potentiometer to make Vbe to around .8V , you can see that the LED brightness increases. This is because when Vbe=.5V it starts with cut off and when Vbe=.7V in active and Vbe=.8V it become saturation region. Transistor is a current controlled device. In active region Ic=hfe Ib and in saturation region Ic>hfeIb. That is why the brightness of the LED changes.

VII. ADVANTAGES

It creates Eco friendly environment. Automation system for cleaning of road(no human effort for cleaning road). Less cost for cleaning city than manual human effort. .City can be kept clean.

VIII. FUTURE ENHANCEMENT

Separation of dry and wet particles which is in the container. The trash collected wet particles can be recycled and used for agriculture. Smart dustbin can be used.

IX. CONCLUSION

It is impossible to clean the city roads. Cleanliness can be done by transportation means. An eco friendly environment can be created with less cost. City can be kept clean with less human effort.

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Speech enhancement of alt speech using spectral Subtraction and template matching

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ABSTRACT

Speech enhancement is one of the applications of speech processing. In this paper, the speech quality and the speech intelligibility of the disordered speech is improved with speech enhancement technique. The artificial larynx transducer (ALT) speech is taken and improved in terms of naturalness and intelligibility by introducing variations in the F0–contour and template matching with correlation coefficient. Initially, two different speech signals are introduced, healthy speech signal and disordered speech signal. Here, the disordered speech signal is considered as ALT speech. The fundamental frequency and its corresponding contour is extracted from each of the input speech signals. Both the fundamental frequency and F0 contour are involved in the gender classification using K-means algorithm and K-NN algorithm respectively. ALT speech contains directly radiated electro larynx noise (DREL). The noise is filtered out using spectral subtraction algorithm. Once DREL noise is removed from ALT speech, the quality of the speech is greatly improved. The ALT enhanced speech signal is then compared and mapped with healthy speech signal by means of template matching algorithm which makes use of correlation coefficients. This improves the overall quality, in terms of naturalness and intelligibility of the introduced disordered speech signal. This technique helps to solve the major problems of speech, faced by differently abled persons such as larynx disorder.

KEY WORDS: Artificial larynx transducer (ALT), speech enhancement, disordered speech, larynx disorder, speech naturalness, speech intelligibility, F0 contour, fundamental frequency, correlation coefficient, directly radiated noise (DREL), K-measns algorithm, laryngectomy K-NN algrorithm, spectral subtraction, template matching algorithm.

1. INTRODUCTION

Laryngectomy is the final option for people suffering from laryngeal cancer which involves the complete removal of the larynx. Once the larynx is surgically removed, thempatient loses his ability to speak. One of the possibility to be, able to communicate again, is with the use of ALT device as shown in Fig.1. This is a small, hand-held and battery driven. When a user speaks with an electrolarynx, it is held by the user's one hand and attached to his or her lower jaw. The vibrations are transmitted through the skin and the electrolaryngeal speech is produced by the user's articulation.

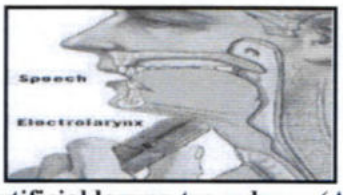

Figure.1. Artificial larynx transducer (ALT) device

Generally the speech signal is produced when an excitation signal gets generated at the sound box called as larynx. The sound box consists of two components which are vocal tract and vocal cords. When these vocal cords vibrate with their natural frequency of vibration, a periodic excitation is generated. The frequency of vibration of the vocal cords is known as the fundamental frequency (F0) or pitch frequency. The band of movement is called as contour, the contour of variations of the pitch period is named as pitch contour (F0 Contour). Using these features, the gender was classified. Gender classification is useful in many fields. For instance, it is used in various applications such as speech recognition, speaker verification, annotation and retrieval of the multimedia database, synthesis, smart human-computer interaction and biometrics.

The ALT speech contains directly radiated noise. In this work, the simple method of spectral subtraction algorithm is used, to remove DREL sound. The spectral subtraction algorithm is the simple enhancement strategy to reduce noise from the captured signal. The spectral subtraction algorithm is one of the first algorithm suggested for noise reduction. It is simple and easy to implement with different speech signals. Th spectral subtraction is based on estimating the noise spectrum, when a speech signal is not there, then subtract it from the noisy speech signal, to acquire clean speech signal spectrum. Once DREL noise is removed from EL speech, the quality of the speech is greatly improved. After that, the speech is applied to the template matching algorithm with correlation coefficient method used for speech enhancement. Template matching is a method for signal pattern recognition, for finding small parts of a speech signal which match a template speech signal. This method is intended to find similar parts of a signal or image to obtain a predefined template signal or image that quantify the similarity of shapes among test and template signals. The F0 contour and correlation coefficient played important role in the overall enhancement of the disordered speech signal.

Fuchs (2013), has improved the performance of EL speech signal with their technique of Automatic speech recognition (ASR) systems. An electro larynx device offers the possibility to re-obtain speech who suffers from laryngeal cancer. Speech produced by an electro larynx suffers from poor speech sound quality, so there is a strong need to enhance EL speech. The disordered speech is applied to ASR, which is a method to improve the intelligibility of disordered speech. Nakamura (2010), investigated a speaking aid system with an air-pressure sensor for electro-laryngeal speech to control F0 contours using breathing air. The outcome of EL (air) speech conversion was better than those of EL speech conversion. Uemi (1994), have proposed a new EL that allows the laryngectomees to control the fundamental frequency (F0) of the EL using the breathing air from the expiration pressure. Though, the ability of pitch control is improved using expiration pressure over a short period of training. Milner and Shao (2007),. inspected the predicted fundamental frequency and voicing information for reconstruction of speech. Using this method intelligibility of the reconstructed speech has been prepared uniquely from the Mel frequency cepstral coefficient vector stream. Haderlein (2004), introduced trachea-esophageal (TE) speech as a substitutional voice. Using hidden Markov model (HMM) algorithm, improved the recognition results in terms of low clarity and intelligibility by modifying a speech recognizer trained on normal, non-pathologic voices to single TE utterer's. A strong requirement is need to enhance ALT speech. Therefore, our intention is to perform algorithm of spectral subtraction and template matching with correlation coefficient to enhance ALT speech .

Data base: In this paper, the database is created for Artificial Larynx Transducer (ALT) and healthy speech signals of a female and as well as a male speaker. In the samples taken, the speaker's speech contains both healthy and disorder voice. All speakers were between 22 and 25 Years of age. They spoke the sentences with their natural, healthy voice (HE) and then utlizing an electrolarynx device (ALT). The database was created with recordings in a sound-treated chamber. The database was stored with wide variety of speeches in .wav format, which consist of various types of different recognized utterances or template voice signals.

2. PROPOSED METHODOLOGY

The method proposed is as shown in Fig.2, firstly we take two kinds of speech signals i.e. ALT speech or disordered speech, as well as Healthy speech. Next is the pre-processing step, here we resample the speeches into sampling frequency of Fs=8kHz. A high pass filter (HPF) is used to remove DC and the very low-frequency components, then the directly radiated noise is removed which is contained in the ALT speech, using a Spectral subtraction technique (Fukane and Sahare, 2011). Then we perform the training and test step, here the F0 contour features are extracted from the ALT and healthy speech signals using the Praat speech software tool (Boersma and Heuven, 2001). The features of F0 contour values are aligned with time using Dynamic Time Warping (DTW) algorithm (Murali Krishna, 2011). Then the gender was classified using the features extracted with the help of K-NN algorithm (Suguna and Thanushkodi, 2010). Once the gender was classified, in the next step, we perform template matching with correlation coefficient algorithm, to get the speech with enhanced result.

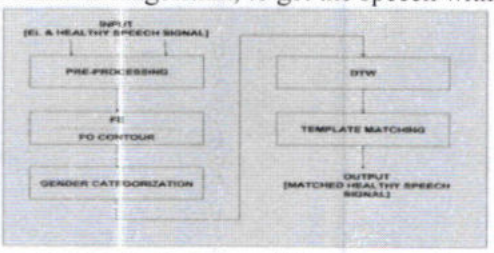

Figure.2. Block diagram of the proposed system

FE=Feature extraction, DTW=Dynamic time warping

Classification Techniques: The various features of a speech that can be extracted for analysis are basically fundamental frequency and pitch contour. Based on our analysis of the current work, various implementations have been done using the features of the fundamental frequency and F0 contour (Uemi, 1994). Now we use these features extracted for classifying the gender in accordace with the healthy and disorder speech samples. The below-mentioned Fig.3, shows the block diagram of the first step of the proposed system, that is the pre-processing stage. The next sub-sections focus on the various techniques for speech feature extraction.

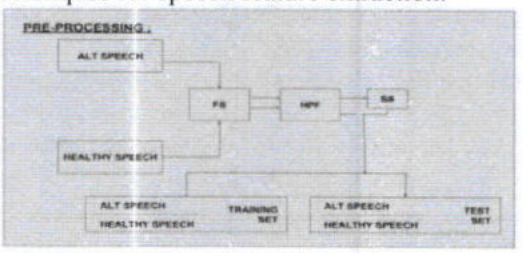

Figure.3. Block diagram of the pre-processing step

HPF=High pass filter, SS=Spectral Subtraction, ALT=Artificial larynx transducer.

Fundamental frequency Analysis and Gender Classification: When the vocal cords vibrate with their natural frequency of vibration, a periodic excitation is generated (Nakamura, 2010). The frequency of vibration of the vocal cords is known as the fundamental frequency (F0) or pitch. Generally, the fundamental frequency is higher for the female speaker as compared to the male speaker. Typically the range for men it is 85-155 Hz, whereas for women it is 165-300 Hz. The fundamenmtal frequency is represented by:

$$F_0 = 1/\tau_s \text{ OR } F_0 = 1000/\tau_{ms} \quad (1)$$

Pitch extraction algorithms is implemented using short-time autocorrelation function. The autocorrelation function gives a measure of similarity between a signal and a time-delayed version of itself. By using the hamming window of duration 20 to 30 ms, here the signal is windowed. the equation of autocorrelation function is given by,

$$R(k) = \sum_{n=-\infty}^{\infty} x[n] + x[n+k] \quad (2)$$

The gender classification is important in many fields. For example, it is useful in many applications like biometrics, speaker recognition, speaker verification, and speaker annotation, retrieval of multimedia database etc. The classification can be implemented using several approaches like Naive Bayes classifier, Probabilistic Neural Networks (PNNs), Support Vector Machines (SVMs), K-NNs classifier, GMM based classifier and K-means clustering algorithm (Suguna and Thanushkodi, 2010). In this work, the gender classification is done with the help of healthy person's and disorder person's fundamental frequency. The gender was classified by the means of K-means clustering algorithm.

F0 contour Analysis and Gender Classification: The periodic impulse train generated from the vibrations of the vocal cords it acts as an excitation for the voiced speech signal. However, if we trace the pitch period over the entirely voiced segment, we can find out that there is a small variation in the pitch period. The contour of variations of the pitch period is named as pitch contour (F0 Contour). The band of movement is also called as a contour. Contour should gradually descend (Uemi, 1994). If the contour band is not there then the speech is not considered to be natural, it would sound like robotic voice. In this work, the speech quality was improved in terms of naturalness and intelligibility using F0 contour (Fuchs and Hagmuller, 2012). The contour is the main feature which retain naturalness in the speech. The fundamental frequency contour features are measured from the ALT and healthy speech signals using the Praat speech software tool (Boersma and Heuven, 2001). Afterwards, the gender was classified with F0 contour using K-NN algorithm (Suguna and Thanushkodi, 2010). K-NN algorithm or the K nearest neighbour algorithm, it stores all the available cases and then classifies new cases, based on a similarity measure (e.g., distance functions). The distance is calculated using different measures like Euclidean Distance, City-block, Minkowski Distance, and Mahalanobis Distance (Suguna and Thanushkodi, 2010). In this work, the features distance are measured using Euclidean distance. The Euclidean distance can be represented as,

$$d_E(x,y) = \sum_{i=1}^{N} \sqrt{x_i^2 - y_i^2} \quad (3)$$

Noise suppression: Every audio signal is associated with some kind of environmental noise (Fukane and Sahare, 2011). Noise suppression is an audio pre-processing method which removes background noise from the obtained signal. The noise component of the signal can be considered as either stationary or non-stationary. Noise suppression is mainly used in voice communication application such as SIP calls, video chat and video conferencing. To remove background noise in the noisy speech signal, some of the techniques used in the speech processing are spectral subtraction, cepstral mean subtraction, modulation filtering technique, wiener filtering, Kalman filtering (Fukane and Sahare, 2011). Among this method, the spectral subtraction is the best algorithm for removal of background noise (Boll, 1979).

Spectral subtraction method: Spectral subtraction algorithm is the simple enhancement strategy to reduce noise from the captured signal. Spectral subtraction with voice activity detection (VAD) algorithm suggested for noise reduction. It is simple and easy to implement with different speech signals. In this algorithm, we use VAD to determine whether a signal sequence frame should be considered as speech or non-speech. Noise spectrum estimates are calculated based on these frames considered as non-speech. After spectral subtraction, we apply residual noise reduction and additional attenuation during non-speech activities to reduce the well-known musical noise as well as to further reduce the noise level (Verteletskaya and Simak, 2011). Assuming that n (m) is additive to the speech signal x (m), the noisy speech signal y (m) can be written as,

$$y(m) = x(m) + n(m) \quad (4)$$

Where, m is the discrete time index. In the frequency domain, the equation (4) can be written as,

$$Y(w) = X(w) + N(w) \quad (5)$$

Where, Y (w), X (w) and N (w) are the Fourier transforms of the noisy signal y (m), the original signal x (m) and the noise n (m). Fig. 4 shows a block diagram of spectral subtraction method. The noisy signal y (m) is segmented into N of samples and resamples at the sampling frequency of fs=8000Hz. After that, Hamming window is applied

to framed signal and then applied either Discrete or Fast Fourier transform (DFT) to the windowed signal. Noisy signal obtain and applied to the noise estimation block. The noise estimation block is used for estimate the overall noise in the original speech. The estimated time-domain clean speech signal is obtained by taking the inverse Fourier Transform.

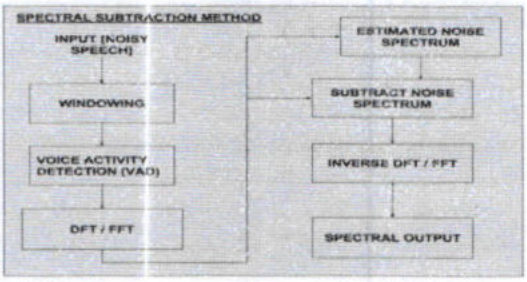

Figure.4. Block diagram of spectral subtraction method

Template matching with Correlation coefficient: Template matching with correlation coefficient method is used for speech enhancement. Its a method for signal pattern recognition, for finding small parts of a speech signal which match's a template speech signal (Lewis and John, 1995). This method is intended to find the similar parts of a signal or an image to a predefined template signal or image, this quantifies the similarity of shapes among test and template signals. The correlation response between the two different signals is represented as,

$$C = \sum_{x,y} f(x,y)t(x,y) \qquad (6)$$

The function of the correlation is a measure of how similar two signals are to each other and it is also called as cross-correlation (Lewis and John, 1995). The correlation coefficient clearly provides a measure of the signals similarity of the shapes at that time lag.

3. RESULTS AND DISCUSSION

The results and discussion of this research work is divided into four subsections, firstly we will discussion on the performance anlaysis of gender classification using fundamental frequency, secondly we will discussion on the performance analysis of gender classification using F0 contour, thirdly we will discuss on the performance of spectural subtraction algorithm, finally we will discuss on the performance of template matching with correlation coefficient.

Performance analysis of gender classification using Fundamental frequency: The gender classification using fundamental frequency is implemented in MATLAB with the help of voice samples (30 pairs, a pair consists of a male and a female voice sample) are collected for the training of the gender speech classifier. For testing, 20 pair of speech samples are taken. The fundamental frequencies (pitch) are measured for both male and female of healthy and disorder speech. The pitch extraction algorithms implemented using short-time autocorrelation function (Jain, 2014). Typically the range of pitch for men is 85-155 Hz, whereas for women it is 165-300 Hz. For gender classification, we have preferred the method of K-means clustering algorithm (Patel and Prasad, 2013). Usually, the classification can be done by setting threshold value, but here we preferred K-means clustering because the healthy voice samples can be classified by setting the threshold value but using disorder voice samples, the features cannot classify with the help of threshold value. So, both healthy and disorder voice samples of gender classification are done by K-means clustering algorithm. K-means clustering algorithm is proved to be, one of the most simplest unsupervised learning algorithms that solve the well-known clustering problems (Patel and Prasad, 2013). The procedure follows a easy way to classify a given data set through a certain number of clusters, (assume k clusters) fixed apriori. So, here k=2 (define k centre), one for each cluster, it will classify into either male or female. Each cluster in the partition is defined by its member objects and by its centroid, or center. The centroid for each cluster is the point to which the sum of distances from all objects in that cluster is minimized. K-means computes cluster centroids differently for each distance measure, to minimize the sum with respect to the measure that you specify.

From the below given Fig.5, and Fig.6 as shows, the cluster 1 and cluster 3 denotes that training and test data of female healthy and disorder voice sample features. The cluster 2 and cluster 4 denotes that training and test data of male healthy and disorder voice sample features. So, using k-means clustering algorithm the gender was classified both of healthy and disorder voice samples successfully.

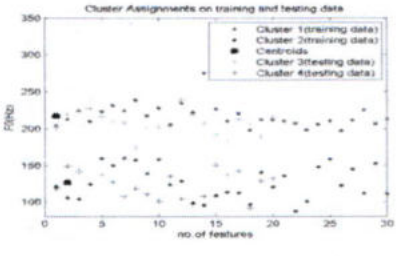

Figure.5. Simulation result of healthy speech

Figure.6. Simulation result of disordered speech

Performance analysis of gender classification using F0 Contour: Initially, the voice samples of 20 pairs (a pair consists of a male and a female voice) are collected for the training and testing of the gender speech classifier. The F0 Contour extracted from the ALT and healthy speech using the algorithm provided by the Praat speech software (Boersma and Heuven, 2001). Afterwards, the features are imported to MATLAB. Then, gender classification implemented in MATLAB using K-NN classifier. Ten male and female F0 contour are trained as per the data and then group is classified into class 1 named as male and class 2 named as female. The given test data can be classified based on training data and finally the gender was classified successfully.

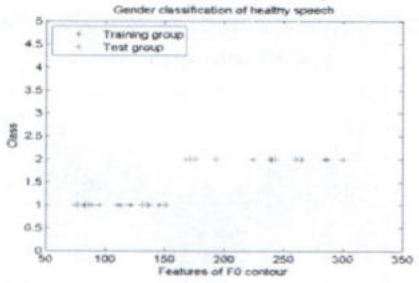

Figure.7. Gender classification of healthy voice using F0 contour

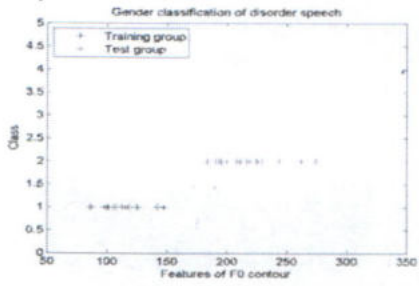

Figure.8. Gender classification of disorder voice using F0contour

As shown in Fig.7, and Fig.8, the training group indicates that F0 contour of male and female it is classified as per the group and the test group indicates that F0 contour of male and female it is classified based on the how training data can be classified.

Performance of Spectral Subtraction Algorithms: The spectral subtraction algorithm was implemented in MATLAB. Ideally, the Spectral subtraction algorithm improves both intelligibility and quality of speech in noise The intelligibility and speech quality measures the true performance of speech enhancement Algorithms (Fukane and Sahare, 2011). Boll (1979), did performe intelligibility and quality measurement tests using the Diagnostic Rhyme Test (DRT). The Result indicated that SS did not decrease speech intelligibility but improved speech quality particularly in the area of pleasantness and inconspicuousness of the background noise (Boll, 1979). In this paper, spectral subtraction algorithm used only for ALT speech. Because the ALT speech contains directly radiated noise (DREL) as shown below in figure Fig.9. The noise is removed from noisy speech signal using spectral subtraction method. After applying SS to the ALT speech, the quality of the speech is improved but intelligibility and naturalness had not improved.

Initially, two input speech signal of disorder and healthy were taken. Both the speech signal resampled at 8 kHz. After that Hamming window is applied to the frame signal. The output frame portion is given to Discrete Fourier Transform DFT/FFT (Kaladharan, 2014). After applying DFT/FFT, calculate for the magnitude and phase for each frame. The log magnitude of the disordered signal is as shown in Fig.10. As we do not know the correct phase of the noise signal, we subtract the magnitudes and leave the phase of X alone, the original (as shown in Fig.11.) healthy speech signal is used for finding magnitude (Fig.12) which is used along with the disorder signal magnitude to calculate the noise estimation spectrum. Then it also verifies the entire section and evaluates the noise estimation by using the SS method (Kaladharan, 2014) as shown in figure Fig.13. Subtracted noise spectrum is calculated by subtracting Fig.10 and Fig.13. The result of subtracted noise spectrum shown in Fig.14. After executing the entire operations, the next step is to perform IDFT/IFFT to get back the new signal. Finally, we realize the overlap and we add a method to the new signal to recover clear speech from noisy speech signal as shown in Fig.15.

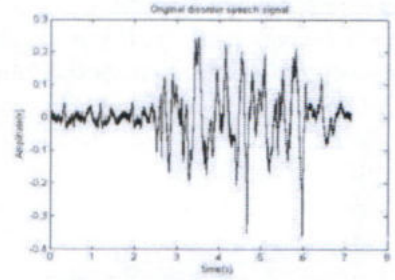

Figure.9. Simulation result of original disorder speech with noise

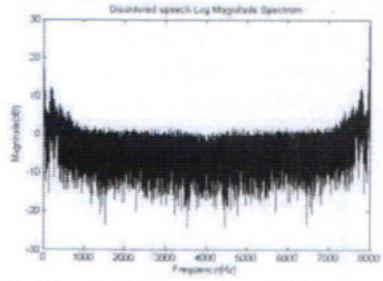

Figure.10. Simulation result of disordered speech log magnitude spectrum

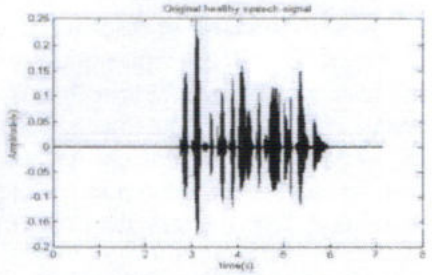

Figure.11. Simulation result of original healthy speech

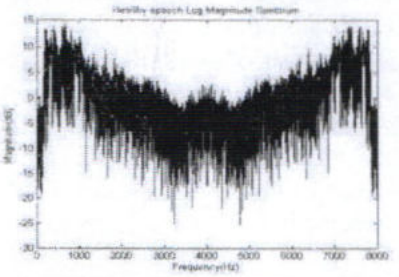

Figure.12. Simulation result of healthy speech log magnitude spectrum

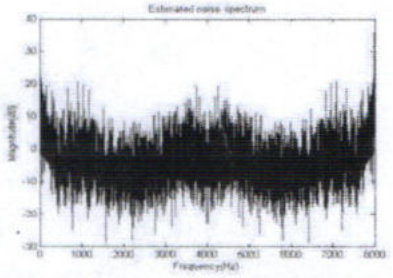

Figure.13. Simulation result of estimated noise spectrum

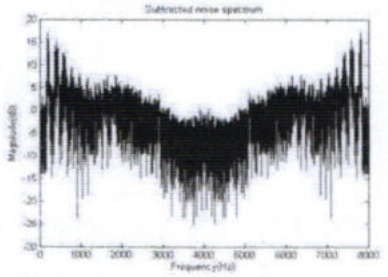

Figure.14. Simulation result of subtracted noise spectrum

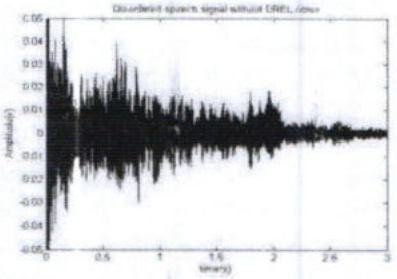

Figure.15. Simulation result of disordered speech signal without noise

Performance of Template matching with Correlation Coefficient: Template matching with correlation coefficient provides increase the intelligibily of the speech. Correlation is an important tool in image processing, pattern recognition, and other fields. The two signals (cross-correlation) correlation is a standard approach to detect feature (Lewis and John, 1995), the template matching can be done for both healthy and disorder speech with the help of correlation coefficient. After spectral subtraction the speech quality was improved but again the intelligibility of the speech signal has not improved. To improve the intelligibility of ALT speech signal, we have selected template matching with correlation coefficient algorithm. In this process, we took 15 ALT speech signals which is subjected to DREL noise removal and gender classification. We estimate the coefficient correlation of 30 healthy female voice samples stored or 20 healthy male voice samples stored based on gender classification result. From the resulting correlation coefficient maximum value is identified. Once, we find out the maximum correlation coefficient value, it will track back the original utterance of healthy voice and then it will playback healthy sound instead of ALT speech. Likewise, the ALT speech quality was enhanced using template matching with correlation coefficient. Fig.16 and Fig.17 shows the result of template matching method using one female and male ALT speaker. In, Fig.16, second speaker have maximum coefficient value, so instead of disordered speech the maximum coefficient healthy speech signal it will playback. In, Fig.17, the first speaker have maximum coefficient value. The first speaker utterance will playback instead of disordered speech utterance.

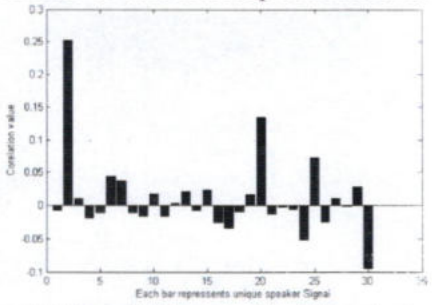

Figure.16. Simulation result of female speakers

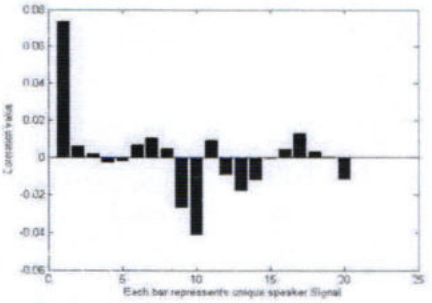

Figure.17. Simulation result of male speaker

4. CONCLUSION

The prime intend of this work is to refine the disordered speech quality. To enhance disordered speech quality, two methods are introduced namely, spectral subtraction and template matching algorithm. Initially, in this work the gender was classified using the extracted features of fundamental frequency and F0 contour. The K-means and K-NN algorithm were considered for gender classification. It has been observed from the simulation results that the test data classifies the gender based on the training data. It was concluded that the gender recognition showed the distinguishable classification between male and female by making use of fundamental frequency and F0 contour feature. The next step involved the use of spectral subtraction technique to improve the quality of the speech. In this method, the parameter magnitude spectrum played an important role to enhance the speech quality. It is found from the simulation results, that subtraction of the magnitude spectrum of noisy speech signal and estimated noise spectrum will improve the quality of the speech. This technique increases the speech quality in terms of comfortness of listening whereas the intelligibility is not improved. In proposed method, to improve intelligibility of the speech , a new approach was introduced namely, template matching algorithm using correlation coefficient. The proposed method was greatly improved the comprehensibility of the speech. As of now, our work shows best results based on the template matching method.

Future work: The proposed method was done considering only few English utterances with restricted amount of templates. In future the same work can be expanded to many different languages with inclusion of many more templates for different individual age groups, thus making the system more robust and versatile. In this proposed method, only the main parameters like fundamental frequency and correlation coefficient was taken into consideration. In future, this work will be extended to additional parameters like formant frequency and glottal excitation to make the utterance more intelligible.

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Solar Based E – Uniform for Soldiers

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Abstract— — **Solar based E-Uniform gives better protection to the soldiers who are working in extreme weather conditions. Solar Panels are used to power up the internal circuitry of the E-uniform. A 12 V DC lead acid rechargeable battery is used for storing the energy. We are using conventional battery charging unit also for giving supply to the circuitry. AT89S52 micro controller is the heart of the circuit as it controls all the functions. A voltage sampler is interfaced with the system using ADC 0808 to get the voltage generated from battery as a display on a 16X2 LCD. The project is operated in summer mode and winter mode. By selecting the mode of operation, we are operating the H-Bridge IC such that it can drive body heater/cooler. The heater/cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment. The metal sensor will detect the metal like bomb and intimate the soldier with a buzzer indication. We are using Zigbee Technology for monitoring the uniform, and we are using emergency button for the security of soldiers.**

I. INTRODUCTION

Soldiers are the Army's most important resource. Soldiers play a vital role to protect one's country. The term soldiers include service men and women from the Army, Air Force, Navy and Marines. They will always be the one responsible for taking and holding the duty in extreme weather conditions throughout the year. While providing security to the nation, they may face troubles in extreme hot/cold weather conditions. Both very hot and cold temperatures could be dangerous to health. In this project we are going to design an E-Uniform which gives better protection to the soldiers who are working in extreme weather conditions.This paper is gives two modes summer mode and winter mode .By selecting the mode of operation the relays drive body heater/cooler. The heater / cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment and he can work efficiently without heat stress or cold stress

II. EXISTING SYSTEM

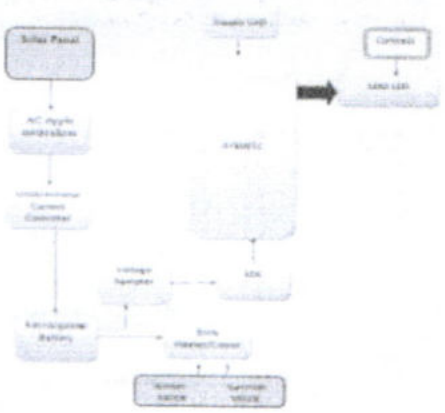
Existing system applications are limited as it provides body temperature regulation only, but nothing more than that. It does not provide any means of Security, Navigation, and Monitoring at a remote place. Copyright form and the form should accompany your final submission.

III. PROPOSED SYSTEM

Here we are using Micro controller (AT89S52) allows dynamic and faster control. Liquid crystal display (LCD) makes the system user-friendly. Here we are using LCD Display for displaying the values of present and maximum voltage values which are present in the rechargeable battery.

The project is operated in two modes summer mode and winter mode. By selecting the mode of operation such that it can drive body heater/cooler. The heater/cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment and he can work efficiently without heat stress or cold stress. The metal sensor will detect the metal like bomb and intimate the soldier with a buzzer indication.

BLOCK DIAGRAM OF SOLAR BASED E – UNIFORM:



IV. PELTIER PLATE

The most common temperature control option for the AR rheometers is the Peltier Plate. The AR-G2, AR 2000ex and AR 1500ex Peltier plates have a temperature range of -40 to 200 °C with a typical heating rate of up to 20 °C /min. and a temperature accuracy of +/- 0.1 °C. A PRT (platinum resistance thermometer) sensor positioned at the center of the plate ensures accurate temperature measurement and control.

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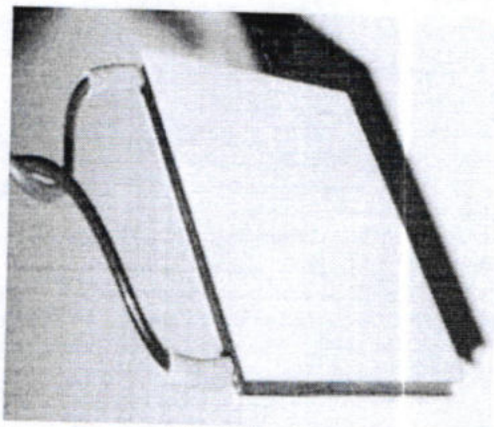

Fig: Peltier Plate

A peltier cooler is a cooler that uses a peltier element (TEC). Peltier coolers consist of the peltier element itself, and a powerful heatsink/fan combination to cool the TEC.

V. ADVANTAGES

- Protection from extremely low temperature such as 0/Minus Degree in hilly regions
- In deserts where temp is high uniform will maintains cool.
- No need to handle torch lights.
- Fit and forget system
- Reliable
- Compact size
- Affordable prize (Low cost)
- Low Maintenance

VI. APPLICATIONS

- Used in military applications.
- This uniform can be used for all the climatic applications.
- Soldiers can work in extreme climatic applications.

V. CONCLUSION

The project "Solar based E-Uniform for soldiers who work at extreme high temperature or extreme low temperature with tracking" is successfully tested and implemented. By using this project in real time applications we can help soldiers to work even in extreme climatic applications. It is a highly durable and selfrepairing solar technology, ideally suited for mobile applications.

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Smart Power Gen using Renewable Sources with Intelligent Energy Storage System in Grid

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Abstract*: In marine industry shipping is considered as the backbone of international trade as most of the exported goods are transported by ship. Therefore the sea exports are doubled by 2025. To continue with the sea transport without any discontinuity a new and more eco-friendly power has to be generated with the available sources. The power can be generated by using fossil fuels or by using renewable energy sources. Energy crisis increases due to the demand of fossil fuels. The generation of power using conventional source increase the cost of generation and utilizing the same in shipping industry is difficult. Therefore in this manuscript the power is generated using Renewable Energy Sources (Solar, Wind & Ocean). The generated power is configured as grid. But the Static power load (SPL) in ship causes instability issues. To increase the Stabilization and optimization of the electrification, Z Source virtual impedance Compensation technique is used on load side. The generated power using solar, wind and ocean are stored using intelligent hybrid energy storage system.This manuscript deals with CrossBreed Energy Storage System (CBESS) implemented in ship as storage compensation technique. CrossBreed Energy Storage System (CBESS) has an amalgamation of battery unit and Electric Double Layer Capacitor (EDLC) unit, thereby reducing the use of battery and Electric Double Layer Capacitor (EDLC) storage system as individual. The combined feature of battery and Electric Double Layer Capacitor (EDLC) gives higher energy and higher power density. Here, the storage will provide high power density with quick charging/discharging time and the Electric Double Layer Capacitor (EDLC) will compensate the transient demand for a short period of time; therefore compensating the required power by the combined features of its constituents. Besides CBESS is operated by a simple algorithm, to improve its overall efficiency, cost effectiveness, life span and reduce the energy storage size and stress on the battery. The Performance of the entire configurations is analyses, simulated and verified using MATLAB/SIMULINK.

***Keywords*: Renewable Energy, Static Power Load, Z Source Load**

I. INTRODUCTION

Though the Pros of Microgrid is more when compared to conventional grid system, maintaining the stability of the system has become a major concern in different loading conditions. The designed microgrid deals with Constant power loads and exhibits negative incremental characteristics. The property of negative incremental characteristics hampers the microgrid system stability considerably. At present, as the continual increase of the modern inverter-based loads, the problem is being intensified. To increase the stabilization of the system, engineers, professionals, and researchers undergone many research works in and around the world [1-5]. In [7], Kwasinski and Onwuchekwa outlined the different strategies to sort out the problems of steady load in DC microgrids. In view of this, the effect of adding filters and capacitors was studied and it is analyzed that it is not the cost effective system and also the addition of capacitor causes capacitor failure which increases with rated voltage. Load shedding of SPLs can restore stability, but this is of little practical value since it only temporarily restores the system without increasing long-term capacity. Linear and non-linear controllers for time variant and invariant can also be used but the former cannot assure the global stability of the desired equilibrium point and the latter is very challenging in its design and changes with each system's parameters. The generated power can be stabilized and can be sent to the load as reference parameter with slight modification which modifies the SPL behavior of the load. Using such a constrained optimization technique, a method to design the stabilizing system is proposed in [8]. Coupling two systems together can allow the oscillating characteristics of the two systems to dampen each other out [9]. The systems may have slightly different characteristics, usually because of different inductances, or they may be identical but coupled with a small delay factor. Mathematical analysis for two systems has been done to find the region of stability. It is cumbersome to identify the system's stability characteristics for the large complicated system. For that particular case in DC microgrids, instead of over- linearizing, sliding mode control technique- with nonlinear modeling of the system- has been adopted by the researchers. By using a sliding mode controller, a sliding surface has been established to stabilize the voltage of the entire system [10]. In order to attain optimal operation, Bo Wen et al implemented four-wire-lattice network in Non Conventional Energy Source energy resources

for a three phase AC system in islanded mode operation [11] and small signal stability of the system is analyzed using Clark's transformation.

Zeng Liu et al, at [12], analyzed the distributed power system using state variable analysis by infinite norms in input/output matrix, to identify the stability criterion for distributed power system. It is axiomatic that, due to the abrogating incremental load characteristics, the alternation botheration is agitated with the accretion and measurement of the Steady Power Load. Nadeem Jelani et al, at [13], have formed to acquisition out the attributes of this accord and has advised the antecedent works on this issue. To break the instability problem, STATCOM Compensation technique is introduced. At [14], Dena Karimipour et al worked on Popov's Stability criterion, one of the advanced nonlinear techniques, to handle SPL instability issues. Using this technique for AC systems, they have accomplished stability analysis of the microgrid system. Yanjun Dong et al worked with pulse width modulation rectifier to mitigate the Steady Power Load instability. In their research, they introduced a simulation model for AC μ-grid Configurations loaded with SPL at [15]. By adopting a boost rectifier as a SPL load, Zeng Liu et al investigated the stability issues of the system. In that occasion, they used infinite norm impedance matrix for their analysis. Researchers have noticed that all available techniques for SPLs compensation can be classified into several groups of common criteria based on the location of providing compensation. The classifications are mentioned below.

Feeder side compensation to make the system robust against SPL instability.

Compensation by adding intermediate circuitry or elements between the feeder side and load to enhance system stability.

Load side compensation so that the system doesn't experience the effect of Steady Power Loads.

In this manuscript, because of having a number of advantages over the other compensation generalized techniques, virtual impedance based load-side compensation technique have been adopted to improve microgrid stability [16-17].

Energy storage has been promoted as a very significant tool in the integration of Non Conventional Energy Source energy-based μ-grid Configurations. It is adopted by the system engineers and operators due to several important features such as energy time frame shifting, ancillary features, capacity firming, intermittency handling, transmission congestion relief, and power quality improvements. Besides that, from recent researches regarding microgrid stability, the energy storage system can be considered as an important tool to retain microgrid stability. In practice, an energy storage unit assures the required power when it is needed to compensate. In this course, battery storage is the most basic of its kind among the distributed network energy storage systems. It provides easy implementation as well as geographical independence; hence it is comparatively popular to other storage technologies. But, batteries, though easy to implement, are not preferable for compensation technique due to their low power density. Hence, the storage system only comprised of the battery units doesn't experience a sound functionality in microgrid arrangement in case of highly variable distributed energy systems like Non Conventional Energy Source energy sources [18-22]. From figure 1, it can be interpreted that the Electric Double Layer Capacitor (EDLC)s range in between the conventional batteries and the conventional capacitors in terms of energy density and power density. Hence, they are usually installed for the applications where batteries have a shortfall when they require a transient high power. Moreover, to handle the situation of transient high power requirement, conventional capacitors cannot be used because they lack expected energy. On the other hand, Electric Double Layer Capacitor (EDLC)s offer a high power density along with adequate energy density for the most transient high power applications [23]. Matsuo et al, at [24], developed multiport converters with hybrid fuel cell, battery systems and hybrid ultra-capacitor systems. Comparison of various electrochemical storage devices in Energy Density, Power Density and charging time shown in Fig.1.

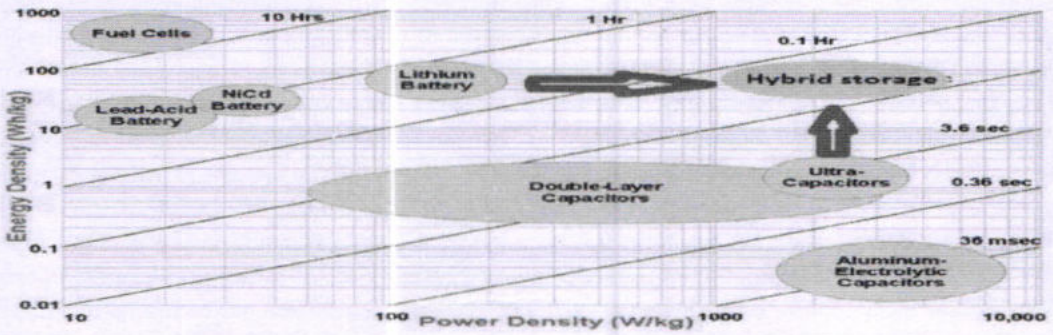


Figure.1 Comparison of various electrochemical storage devices in Energy Density, Power Density and charging time.

T. Yuvaraja et al, at [25], developed fuzzy controlled based distributed generation unit in grid operated in islanded mode with storage system. The Simulation results validate the model and robustness of the proposed control scheme to changes in system loading and power factor. T. Yuvaraja et al, at [26], incorporated Decoupling algorithm and notch filter with three level hysteresis controllers under stiff symmetrical and asymmetrical grid conditions. Also the entire concept is analyzed in dq reference frame. Yuvaraja Teekaraman et al, at [27], concluded that distributed generation units in islanded mode Controlled by Fuzzy model in a reference frame promptly and establish legitimacy of the model and robustness of the control scheme to change system loading and power factor. Yuvaraja Teekaraman et al, at [28], implemented the Solar Energy with new controlling parameter in microgrid under partial shading condition for better stabilization and optimization. The dynamic control scheme is aso presented to analyze the performance of a three-phase grid-connected PV system and to enhance the dynamic stability limit with the change in atmospheric conditions by utilizing the new control factor. T. Yuvaraja et al, at [29], implemented multicarrier level shifted current control, at higher feed forward gain and hence better control characteristics. Also it can be controlled to feed the load real power with the balance real power being supplied from the grid. In addition to real power injection, the objective of load compensation is also achieved leading to a balanced, distortion free, and unity power factor source current.

This manuscript deals with CrossBreed Energy Storage system consisting of both Electric Double Layer Capacitor (EDLC) and battery. As microgrid is a distributed power system, load side compensation technique can be used by implementing this portable SPL compensator. Here, an Electric Double Layer Capacitor (EDLC) contributes also in transient power demand where a battery handles the nominal power requirements. Comparative analysis is done for various storage systems with the designed hybrid storage system and relevant graphical analogies have been represented in this manuscript [30].

A. Conventional Energy Storage Systems for Microgrid Applications

As constant power load exhibits negative incremental characteristics when connected to the grid it experiences a transient spikes in DC bus voltage response. Practically the power handling capacity of CVL is KW or MW and SPL power is of 533 W, the transient spike created by SPL load are significantly higher. Fig.2. shows the microgrid parameter without compensation and is observed with certain disadvantages. To handle this issue, energy storage systems are used in microgrid application. Here, In this manuscript, two kinds of conventional energy storage systems are analyzed. At first, the battery-only compensator is presented here with the regarding simulation platform and performance graphs in several cases. Similarly, the Electric Double Layer Capacitor (EDLC)-only compensator is described here with necessary detail for microgrid application. Furthermore, the advantages and limitations of each storage system will be described.

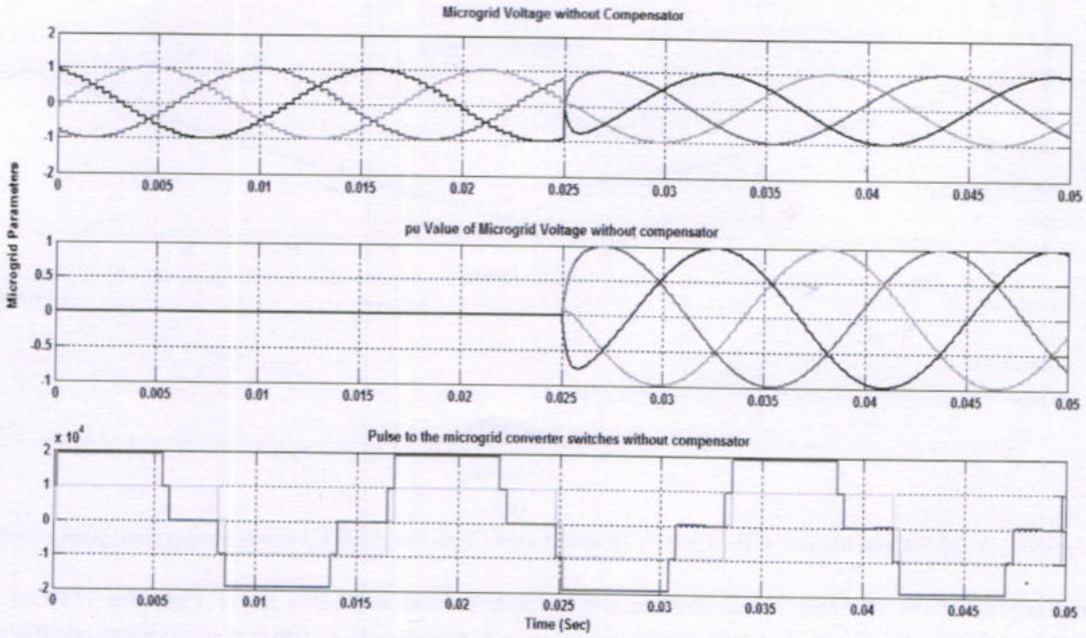


Figure.2. Microgrid Parameter without compensation

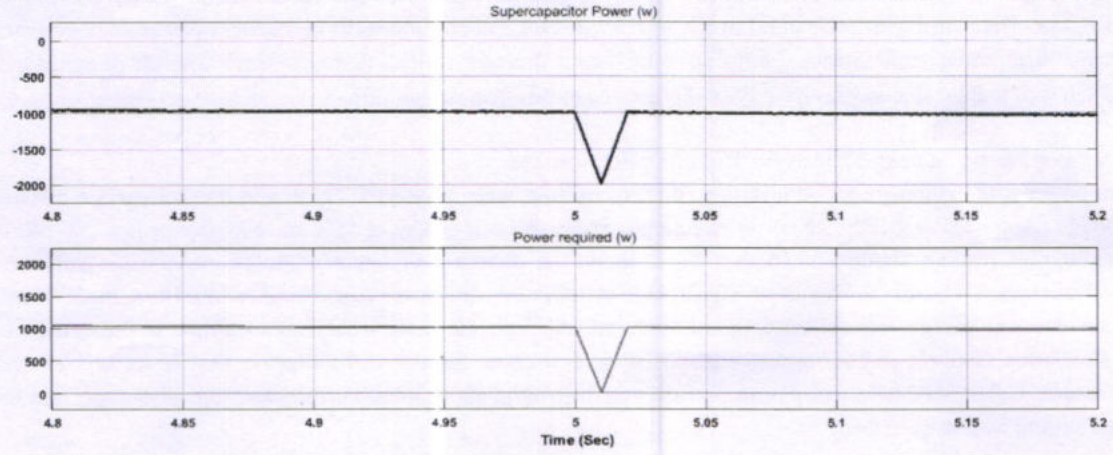
II. MICROGRID SYSTEM WITH COMPENSATOR

The simulation diagram of Microgrid with Compensator is shown in fig.3. When Microgrid tens to fluctuate from the stable voltage range, the battery connected in the system tends to deliver the required Compensated voltage to stabilize the grid. In the simulation the connected battery acts as a compensator.

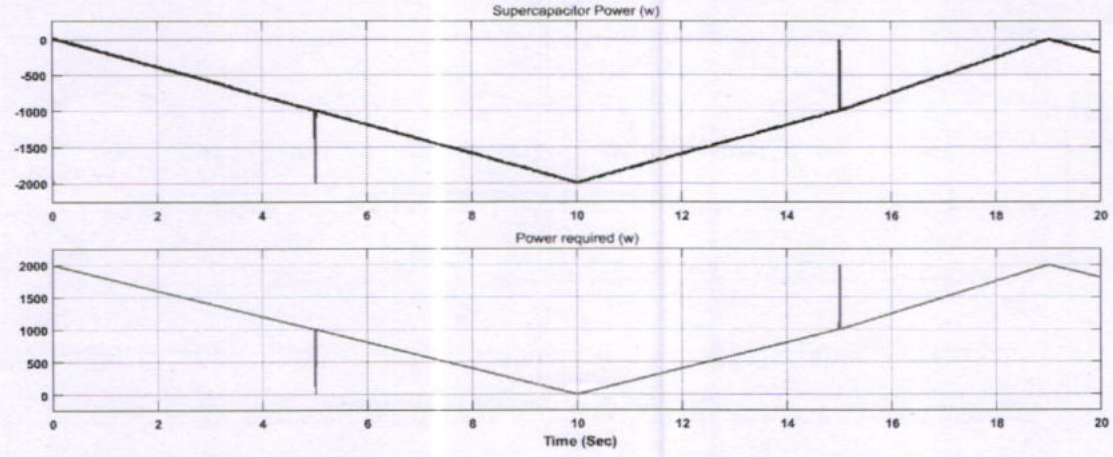
As is obvious from the above graphical demonstrations, the battery-alone compensator supply nominal power efficiently for a longer period without charging-discharging backward and forward, but, in alternative juncture, it's unproductive while it comes to fading transitory demand. Due to the hefty response time and low power density, the battery necessities longer time to maintain constancy. As can be seen from the figure 6, to retain microgrid stability, the transient spikes must be handled effectively. Hence, Electric Double Layer Capacitor (EDLC)-only compensator is used as compensator unit to mitigate microgrid instability. The load profile of the microgrid system is presented at figure 7 in presence of SPL loads.

A. Electric Double Layer Capacitor (EDLC)-Only Compensator

When microgrid voltage tends to fluctuate from the stable voltage range, an Electric Double Layer Capacitor (EDLC) delivers the required compensation to stabilize the microgrid voltage. In figure 3, simulation platform is presented for the entire microgrid system using compensator unit (here, Electric Double Layer Capacitor (EDLC) as compensator unit) in Matlab/Simulink.



(a)



(b)

Figure. 3. (a) Representation of the Electric Double Layer Capacitor (EDLC) power support and power demand,

(b) Representation of the transient power demand and respective Electric Double Layer Capacitor (EDLC) support.In the representation of the Electric Double Layer Capacitor (EDLC) power support and the power demand for a certain period of time are

illustrated to comprehend the practical scenario. In the power demand and the respective power support by the Electric Double Layer Capacitor (EDLC)-only compensator in transient cases are illustrated. To illustrate the characteristic of Electric Double Layer Capacitor (EDLC)-only compensator, the instance of Electric Double Layer Capacitor (EDLC) terminal voltage, current, and power are presented (in the presence of SPL).

III. CROSS BREED SYSTEM IN MICROGRID

Battery alone and capacitor alone configuration have lower energy density and lower power density. To utilize the advantage of highest energy density for an electrochemical battery and highest power density for an Electric Double Layer Capacitor (EDLC) CrossBreed Energy Storage System is proposed in this manuscript. A comprehensive energy management control system is furnished in fig.4 (a) & (b). To microgrid stabilization and to handle SPL transients effectively. The main advantages of a CrossBreed Energy Storage System are

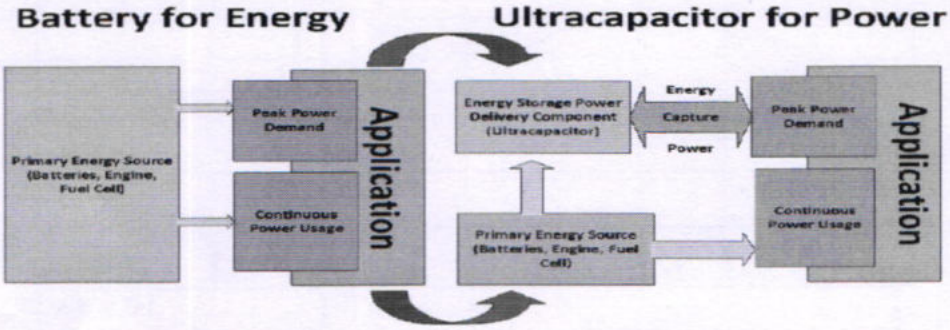


Figure .4. a. CrossBreed System with Energy Storage System for an Microgrid

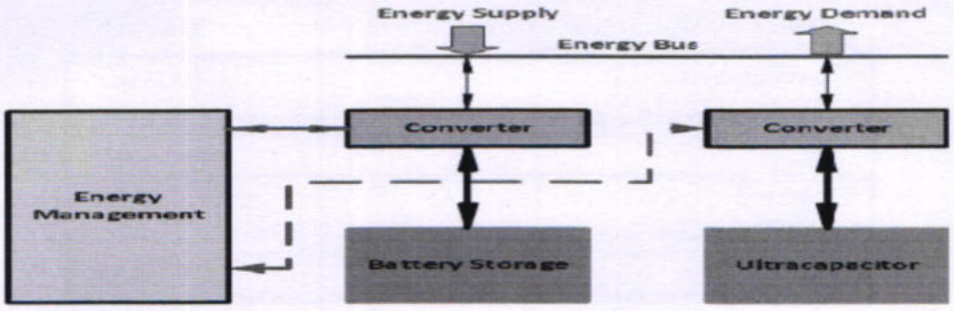


Figure.4. b. Basic Structure of CrossBreed System with Energy Storage System

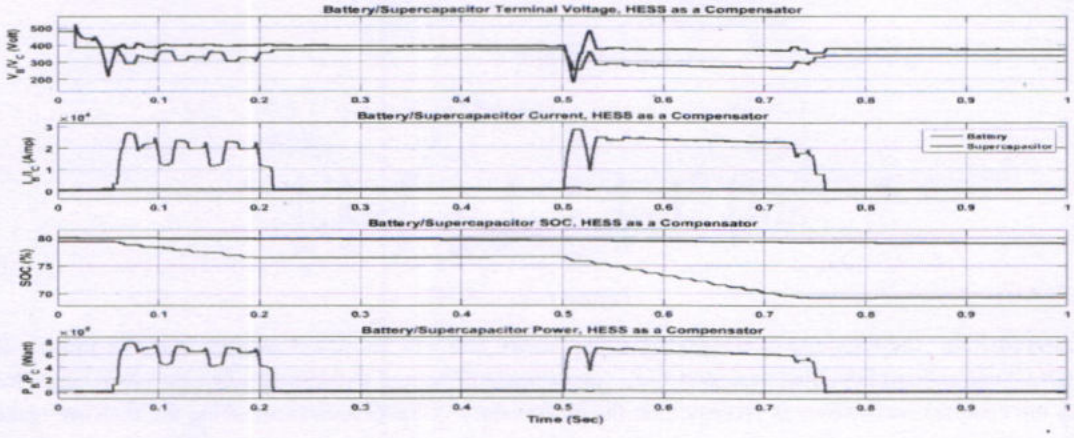


Figure. 5. Characteristics of the CBESS in the presence of SPL

As shown in fig.5. The crossbreed energy system is simulated for a microgrid and the following results are obtained. The results are shown for the current in the battery and ultra capacitor with and without compensator. The battery will initiate compensation according to the logic when terminal voltage remains within 0.99 and 1.01 pu. If the voltage tends to fluctuate from this zone the Electric Double Layer Capacitor (EDLC) will enter the compensation technique the converter and CBESS characteristics with and without the compensator is shown for, the instance of converter voltage, DC bus voltage, CBESS terminal voltage, current, SOC, and power is presented in fig. 8 (in the presence of SPL).

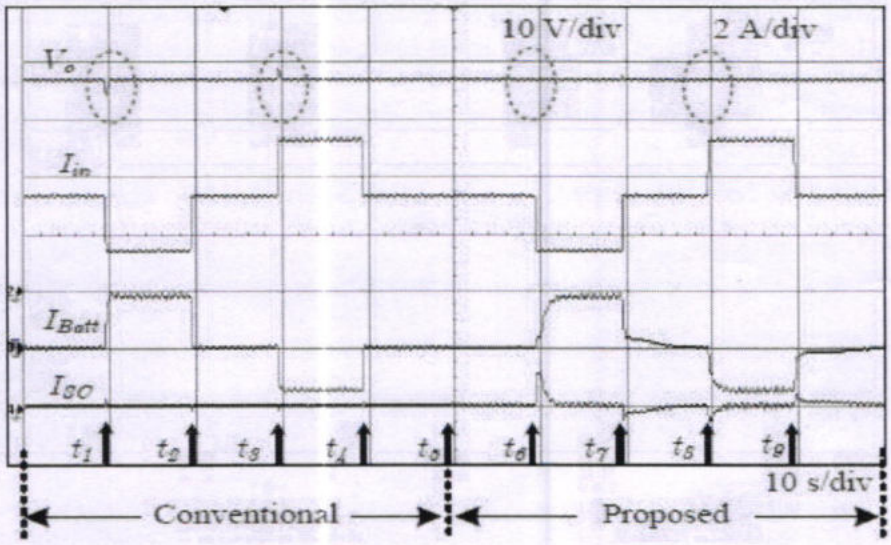


Figure. 6. a. Output voltage, input current, battery current, and SC current;

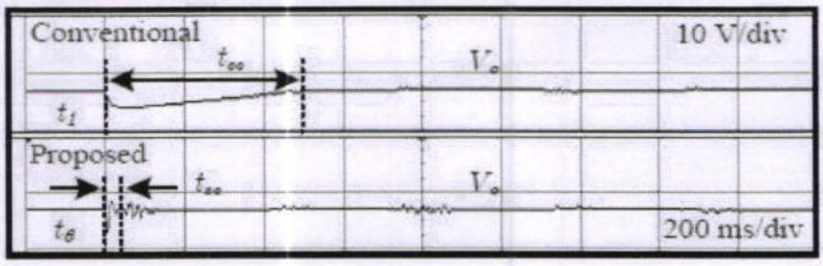


Figure. 6. b. Output Voltage

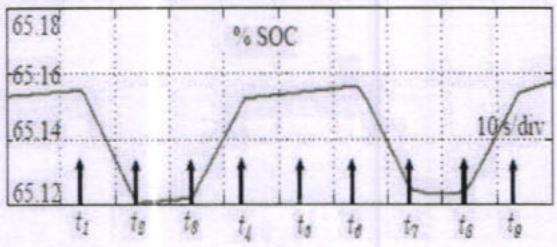


Figure. 6. c. % SOC

It can be observed from the high energy density from the battery unit and the power density from the Electric Double Layer Capacitor (EDLC) unit support both long term slow SOC demanding applications and transient fast load switching overshoot. In fig. 6 (a), (b), (c) the comparative analysis is presented on the performance of handling/compensating the transient spikes among the battery-only compensator, Electric Double Layer Capacitor (EDLC)-only compensator, and CrossBreed Energy Storage System as

compensator. From this, it can be seen that the transient peak occurred in the microgrid system has been compensated up to 1.023 pu in case of battery only compensator, compensated up to 1.02 pu in case of Electric Double Layer Capacitor (EDLC) only compensator, and compensated up to 1.017 pu in case of CrossBreed Energy Storage System. So, it is evident that CBESS can handle the transient spikes most efficiently among these three.

IV. DISCUSSION

Battery size is scaled down significantly because the transient load/peak load demand is eventually compensated by the Electric Double Layer Capacitor (EDLC). The high energy density battery unit cannot sustain at the time of load switching when transient overshoot arises. In consequence, its life cycle reduces dramatically. To solve this dilemma, an Electric Double Layer Capacitor (EDLC) with high power density can be installed to ensure longer power sustainability.

V. CONCLUSION

Z Source Load compensation technique is implemented in shipping industry along with crossbreed Energy Storage System (CBESS) to retain microgrid stabilization and optimized output under stabilized Load condition. In this manuscript battery and Electric Double Layer Capacitor is compared and furnished that battery-only compensator can supply the long-term demand and the Electric Double Layer Capacitor (EDLC)-only compensator can handle the transient demand effectively. To take the advantage long term nominal load and transient demand and effective energy management technique along with CBESS is implemented. From the obtained results and the performance evaluations, it is evident that the CBESS can improve the overall efficiency, cost effectiveness, and life span of the storage system. Besides that, it reduces the storage size and the overall stress on the battery.

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Smart Phone Operated Wheel Chair Using Voice And Body Gesture

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Abstract: -- **Wheelchairs are used by physically disabled people. Now a days technology promises a wide scope in developing smart wheelchair. This paper is to describe a smart wheelchair using smart phone to control the rotation of wheel chair based upon the body gesture and voice of the physically challenged people. In build voice and gesture are used to control the movements of wheelchair as well as by using smart phone. 8 sensors are used among which 2 of them are IR sensors the remaining 6 are for temperature, smoke detection, light detection sensors. This system that allows the user to effectively interact with the wheelchair at various levels of the control and sensing. The system is divided into 3 main units Gesture recognition through Android, Voice recognition through Android, Motor control by signal conditioning. The system is based on grouping an android phone with a Sensors and AVR micro-controllers.**

Keywords:-- **Android phone, AVR microcontroller, Gesture recognition, IR sensor, HC-05 Bluetooth module, H-bridge.**

I. INTRODUCTION

1.1 Background

"World report on disability" jointly presented by World Health Organization (WHO) and World Bank says in this world there are 70 million people who physically disabled. Unfortunately now a days there is continous increase in number of handicapped people due to road accidents as well as disease like paralysis. Among the percentage of all the other disabilities, physically handicapped people are more. If a person is physically disabled then he/she is dependent on other person for his/her day to day work like orientation transport, food etc.

11.2 Disability Statistics in India

We know that every second the World's population well as India is increasing very rapidly. In India 120 million people are disabled out of which 42.02% are physically disabled.

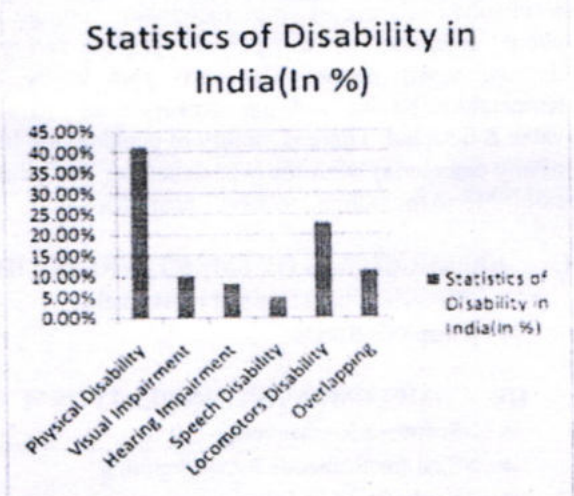

Fig a): Disability Statistics in India

The main aim of the project is to use wheelchair automatically and operate by using voice and gesture control for moving forward , backward ,left and right by smart phone. Traditionally wheelchair have some limitations in content to, bulkiness flexibility, and limited function a wheelchair is fitted with a obstacle sensors , temperature sensor , Gas sensor , smoke sensor , motor and smart phone to help user to achieve some independent mobility function.

By just tilting the smart phone wheelchair can be moved in 4different directions. The obstacle sensor can help the user tocontrol the wheelchair by talking over some of the responsibility for steering and avoiding crashing until the user is able to handle the job. The approach allows the user to use human voice, gesture movement smart phone and synchronize with the movement of wheelchair comfortably

The difficulties is reduced by making use of smart phone so that size of the system is user friendly. The wheelchair is integrated with voice, body gesture and smart phone. So handicapped person who cannot walk, can drive chair by gesture movements using smart phone. Taking advantage of technological development in order to increase the quality of life for handicap people and facilitate their performence into the working world.

To operate a wheelchair various situations can be used. If the user is capable of controlling by voice the ideal solution is use of voice recognition through smart phone otherwise by using body gesture recognition through smart phone. The next part is by using temperature, smoke and gas sensors then parameter value is detected. There is facility of panic button in case of any emergency with the wheelchair so he / she may call /SMS to the police , relative , hospitals.

II. APPLICATIONS OF SMART WHEELCHAIR

- Physically handicapped individuals
- Hospitals Sports

III. IMPLEMENTATION PLATFORM

- -Software Requirement
- -Keil for Embedded Programming
- -Eagle for PCB Design
- -Eclipse for Android Application Design

Hardware Requirement

- AVR microcontroller (ATMega 32)
- Android Phone (Smart Phone)
- Sensors
- Temperature sensor
- LM 35 -IR proximitysensor
- TTL31/38 -Smoke sensor
- IR
- Gas sensor
- M06
- Light sensor
- LDR
- L293D motor driver IC
- Bluetooth controller
- HC05 -Power supply 5O
- ULN 2803
- High Voltage high current Darlington array for logic circuitry and multiple peripheral power loads

IV. BLOCK DIAGRAM

In the project we have made use of voice and bodygesture operation using smart phone to control the location of wheelchair. The system is controlled by AVR microcontroller (ATMega 32) which is also controls the Temperature, Light, Smokes sensors.

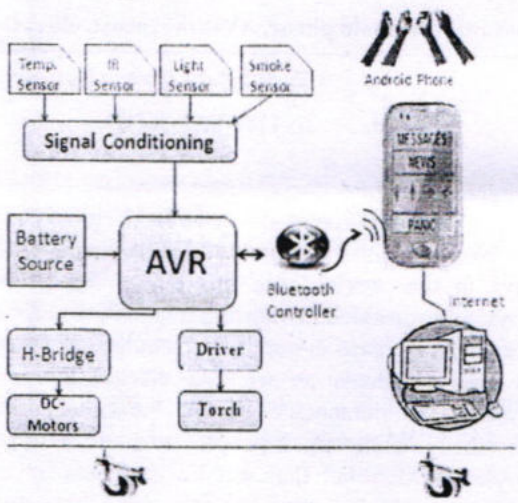

Fig. b) Block Diagram of Smart Wheelchair

The Panic button, SMS reading are controlled by smart phone. DC motors are attached to the wheels of the wheelchair hence based on rotation of motor direction of wheelchair can be operated. Motors are interfaced to microcontroller by using motor drivers. The AVR microcontroller is interfaced with Android phone through Bluetooth controller .depending on the user the voice operation or body gesture operation is done.

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If any emergency problem happened with the wheelchair user by using panic button the message (SMS) will be sent to the caretaker or nearly hospital. In this project AVR microcontroller and Bluetooth module are communicating over UART 9600bps. The module comes in SMD package and works on 3.3V power supply. In this profile the data send and receive to module directly comes on the RX pin of microcontroller. It becomes really easy to make your device Bluetooth compatible.

HC-05 has only 4 pins: 5V, GND, TX and RX. The 5V pin and the GND pin are used for power and the TX and RX pin implement a serial interface. The TX pin is used by the module to send information and the RX pin is used to receive information.

To test the module, I first connected it to my Laptop. This makes it easier to see whether the module is receiving characters or not. By simply using a terminal program like Hyper terminal to visualize what the module is sending from its serial interface.

V. APPLICATION INSTRUCTIONS

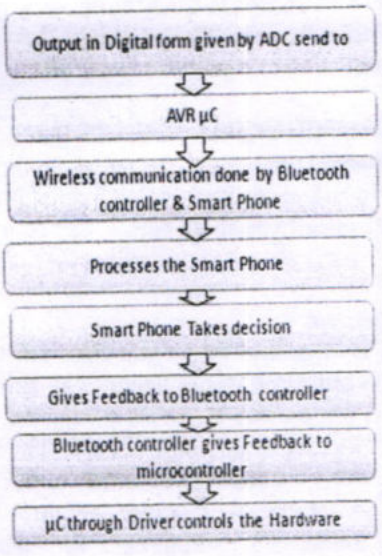


Fig c) Flowchart showing operation of AVR with smart phone.

VI. APPLICATION INSTRUCTIONS

- First make sure that HC-05 Bluetooth module is paired with the Android mobile.
- The default password for pairing is "1234".
- Click on SELECT DEVICE icon to select paired Bluetooth module.

VII. RESULTS

By using the procedure hardware setup is done Fig. d) shows the interfacing of Android Smart phone and the wheelchair.

Final Setup:

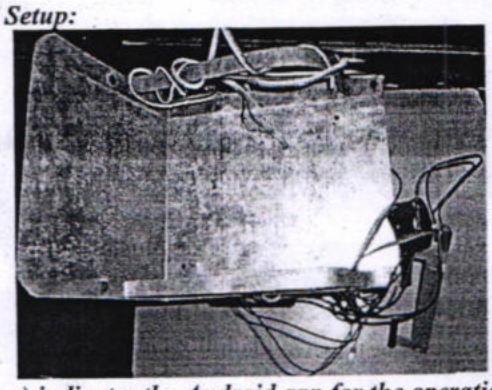
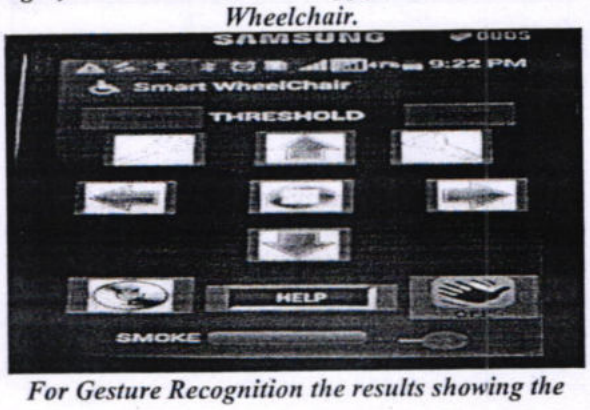


Fig. e) indicates the Android app for the operation of Wheelchair.



For Gesture Recognition the results showing the

Very simple hardware setup.position and the output as description. The above done app is totally based on Android system. Android is an operating system based on the Linux kernel. The project responsible for developing the Android system is called

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the Android Open Source Project (AOSP) and is primarily lead by Google.

Features of Android :

- Open source
- Media Support
- Huge memory
- Fast processor
- Built in I/O devices
- Native support for more sensors
- Improved battery efficiency
- Multitasking
- Have open source software development

Position of Smart Phone	Description
	Go Forward
	Go Backward
	Go Right
	Go Left

Table 2 : The Tilt Of Mobile Corresponding Angle And Output Of Accelerometer

Gesture Direction	X axis	Y Axis	Z axis
Forward	0.45	-8.58	5.36
Backward	-0.45	7.20	6.74
Right	-9.50	-1.99	5.82
Left	8.73	-0.91	5.66
STOP	0.30	0.15	9.80

VIII. CONCLUSION

By using this system physically handicapped people find easy way to navigate within the house using wheelchair without the external help. This provides ease of operation. As the system ses Smart phone so that the accuracy is increased. The Reading of SMS. The sensor describes the parameters like light, temperature , smoke ,gas etc. The IR sensor is used for obstacle avoidance. If any emergency then the Panic button is there for help.
Advantages :

1) Helpfull for physically disabled
2) Easy to use
3) No risk at hardware implementation
4) Physically disabled person can be independent

Acknoledgment

I am thankful to the principal Dr. Gaikwad sir, the PG Co-ordinator, Prof. Shere V.B and My project guide Prof. Wagdarikar N. for their support.

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Smart Home Security through NFC

Abhishek, Anurag. Reji Thomas and Dr.B. Shadaksharappa

Abstract— *Inspired by the "Smart India" initiative, here we present you with our own idea of a Smart Home for the Smart India. As of now most of the people forget their keys in a hurry but no one forgets his Smartphone. So why not to make the smartphone as your security network to control your door? So now the security network can be governed by an NFC present in your phone or by programming an NFC tag to control your smart lock. NFC is known as Near Field Communication but it is limited to a distance of 10 cm maximum for the device to act. So just you need is a Smartphone with NFC and control your door lock with it. It's very secure because NFC tags programmed to the lock can be ciphered and other than you no one can open it. If someone tries to open the lock with brute force the owner can be alarmed immediately.*

Keywords— *Brute Force, Ciphered, Smartphone, NFC.*

I. Introduction

THIS paper presentation is mostly centralised toward the security of a home only, moving around the basic idea and its implementation. A separate section for advantages as well as disadvantages (if there) has been also given. To conclude with, we have also discussed some scenarios related to this technology, that may arise before or after its implementation.

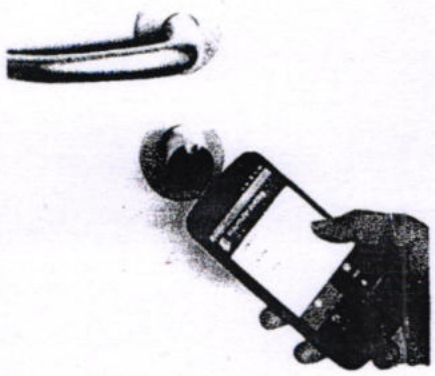
Let's move towards the other part of my main title, the NFC. The most basic question that may arise here is: *What is an NFC?* Near field communication that means Contactless communication. It allows a user to surge the Smartphone over an NFC compatible device (RFID ENABLED) to sending formation without needing to touch the devices together or go through numerous steps setting up a connection. This ensures that NFC is secure and remains easy-to-use with various versions of the technology. Compatibility is the key to the growth of NFC as a popular payment and data transmission method. It must be able to communicate with other wireless technologies and be able to interact with various types of NFC transmissions. The technology behind NFC allows a device to create a radio frequency current that links with another NFC compatible device or a small NFC tag.

Peer-to-peer transmission is also possible through NFC [1]. This allows both devices to send and receive information.

Both businesses and individuals benefit from NFC technology. By integrating credit cards, subway tickets, and paper coupons all into one device, a customer can board a train, pay for groceries, recoup coupons or store loyalty points, and even exchange contact information all with the surge of a Smartphone. Faster transaction times mean less waiting in line and happier customers. Fewer physical cards to carry around means the customer is least bothered to lose one or have it stolen.

II. The Proposition

Let's shift to the centre of my idea with a question: What are we in fact proposing?



To assist the viewer, please refer to the picture.

We are primarily presenting here an idea for a smart door. The salient feature here is we don't want anyone to carry a key with them when they have a mobile phone to do the job. It's simple, just hover phone over the marked area, NFC inside a phone will send a unique signal to the NFC tag, the tag will verify the signal and then send a signal to open the lock and so

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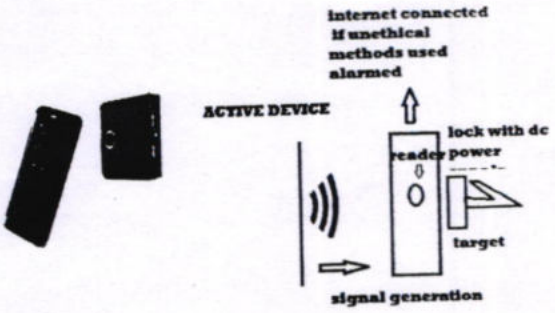
DOI:10.9756/BIJSESC.8235

the door will be unlocked automatically. And all that in just a fraction of seconds.



The best part of NFC tag is that it doesn't require any external power supply to operate. It gets all its energy from the field created in the course of the communication of the two devices.

A. *Why NFC and not QR Codes/ Barcodes?*

Another form of contact-less communication comes in the form of QR codes. QR codes are like barcodes. Yet NFC is more Programmable while QR codes remain the same once generated.

Usage of a QR code is decided depending on the programmed picture coded that links it to a particular task that is non-programmable. If we want to change the link, we must generate and reprint a new QR code.

The major impact in the market of NFC is its flexibility. Storing different types of information and changing it whenever you want to program it to a specific task is very easy and effective just by a single click. The owner can overwrite the information currently on the tag and create a new task to be performed [3].

The second major advantage of NFC is its ease of use. With a QR code, the user must open a scanner app on their Smartphone, hover over the QR code, and wait for the phone to analyse it and react to the code [3].

With NFC technology, the user waves the phone near the NFC tag area and the information is transferred instantly. No need to open an app or wait for analysis. The tag and reader communicate with each other to complete complex transactions quickly and securely [4].

III. Implementation of NFC Doors

Here comes the best part, and let me start with an initial question: How to implement this technology this technology in our homes? The good news here is that you don't need to buy a completely new door to use this. Just use this as an Add-On for your current door by expanding a reasonable amount of money for a single door.

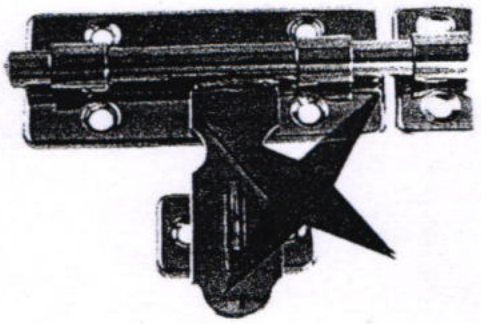
Let's proceed to the constraints that may occur to enact this technology, discussed in the next section.

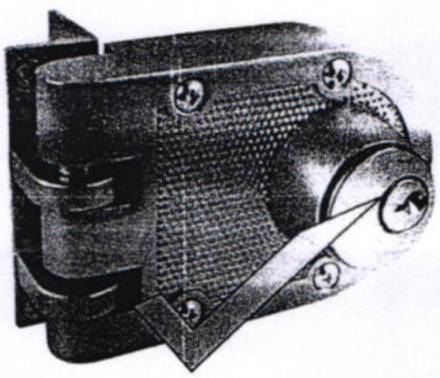
A. *Constraints*

Like any other technology these locks also have a few constraints that may occur while installation of NFC doors.

Types of Locks

The biggest constraint of this technology is that it could not be successfully implemented on all kinds of doors and especially not on the traditional Indian doors. In these doors, the mechanism to open them is too simple that even if we do install a mechanism to open these doors, it won't give the proper results expected and could be easily tempered. However, it's still good news that most of the new homes now a day doesn't have these locks. Rather we use a more advanced and complex lock for better security. So, this constraint can be eliminated.





Availability of NFC Enabled Phones

Another problem that occurs here is in India, there are not many phones available with NFC support, due to the fact that NFC is not really popular here.

However, these days, every Smartphone company is launching new phones with NFC support. But even though if a phone does have an NFC support, its owner doesn't know about it at all. And why would he, he is not using it after all. NFC phones are there with a price bracket under 5000 rupees in the Indian market, but who is interested here in buying them. Everyone wants to buy an iPhone, but not for its features but because it's a status symbol.

IV. ADVANTAGES AND DISADVANTAGES

In this section, we will discuss the advantages or disadvantages associated with usage of this technology.

Advantages

- Contactless communication
- Fast and Convenient
- Very Secure
- Cheap
- Portable
- Lifetime of NFC tag – 5 years [2]

Disadvantages

- Not really popular among Indians
- Fewer phones with NFC support

V. CONCLUSION AND FUTURE WORKS

This technology can actually create a revolution in terms of security. NFC has a vast future, however, currently; this project is just in its initial stage. I am taking several scenarios that may occur if we actually install it, and yes there are some critical issues that also need a look. However, in future, if we do apply it in our practical day to day life, it can change the whole game.

In future, we will be able connect our home locks with our smart phones so as to provide a more interactive and secure interface to the user. Get an SMS every time someone enters through the main door. Expecting guests? Just link their ID to your account, so that they can also enter the house without any trouble. With face recognition system, it would take the security to the extreme level, so as to make sure that it's you and only you who are entering and not someone else who has stolen your phone, to enter the house.

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Smart Guide Extension for Blind Cane

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Abstract: -- **Cane is a tool that used by blind people or someone who has visually impaired which is caused by an accident or an illness. Cane helps the blind people to check whether there are any obstacles around them. However, before doing the research, we conducted a questionnaire to the blind people about what kind of extension module that would be implemented on their cane. Based-on the result, they need an extension smart tools for their cane that can give information about hitch, obstacle, hole, and also the direction of compass wind position to guide their way and also inform them Qibla direction. This research designed a prototype named Smart Guide Extension that can detect obstacles, holes and give information about eights wind direction using Arduino. The obstacles and holes module uses 2 PING Sensors, while the 8 direction of the wind information uses CMP compass sensor 511. All the information will be informed through the sound. The results of testing the obstacle data module stated that the buzzer will be active at a distance of 150 cm – 3 cm and the speed of beep sound faster from 1.1 until 0.3 seconds. The test holes modules state that the beep sound active at a distance of 10 – 50 cm. The system can detect eight direction of the compass wind position with deviation angle position about +30. Based on the questionnaire of trial prototype to the responder, 77.38% of responder stated these tools are user friendly and easily to used.**

Keywords:- **Smart Cane, Smart Guide Extension, cane for blind people, Arduino**

I. INTRODUCTION

Blind people are a term that commonly used for the people who totally blind or still have residual vision but cannot afford their vision clearly. The occurrence of the problems in the visual system can be caused by many things. Some of them are born in the state of blind, accident, illness, etc. A blind people, usually use a cane to walk or go somewhere as a guide to know the direction and state the condition of the passing road. However, the functions of the conventional cane itself is still limited in directing and informing the obstacle to a blind people especially when they are walking up to the remote destination.

Based on that condition, we conducted a questionnaire to the blind people about what kind of extension module that would be implemented on their cane. The result of the questionnaire stated that they need a smart cane which can give information about hitch, obstacle, hole, and also the eight direction of compass wind position to guide their way while they are walking and also inform them Qibla direction to help them doing prayer.

On this research, we designed a prototype called smart guide extension which can be integrated with an ordinary cane. The research aims to make an UID design of extension module as smart guide extension which can give information about hitch, obstacle, hole, and also the position of the user based-on eight position of wind direction. This prototype is equipped with PING sensor and Compass Sensor CMPS 11. PING sensor designed to read the object, obstacle and hole from a distance 150 – 3 cm. The sensor integrated with Arduino and produced the beep sound through the buzzer as information about the existence of the hitch, object, obstacle and also holes. The closer to the obstacle, the faster of the beep sound. Compass sensor 511 designed to provide information about eight wind positions of the compass and also qibla direction to do a prayer.

II. THEORY

A. *Visually Impaired*

The definition of vision impairment by the Centers for Disease Control and Prevention (CDC) says a visually impaired person's eyesight cannot be corrected to a normal level. It may be said that visual impairment is the functional limitation of the eye or eyes

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or the vision system. Based on the data from World Health Organizations (WHO) in year 2011 and 2010, over 285 million people in the world are visually impaired, of who 39 million are blind and 246 million have moderate to severe visual impairment. It is predicted that without extra interventions, these numbers will rise to 75 million blind and 200 million visually impaired by the year 2020.

The people who has visually impaired need a tool to guide their way to do the activities. Canes for the blind and visually impaired are one of the most important identification and mobility aids for this kind of people. There are a lot of canes that are already available in the market, but unfortunately there aren't many variants, especially the canes that can determine the direction based on the wind direction and provide information for the blind people about the located of their position.

B. *Ultrasonic Sensor PING*

PING sensor is an ultrasonic distance sensor which is capable to measure distance in range 3cm – 3m. This sensor is widely used as a proximity sensor in order to detect the distance farther than IR sensor.[1] PING Ultrasonic sensor can be connected to various microcontrollers with 5V voltage ration. Microcontroller must send pulses through PULSOUT before start to do the measurement then there will be the echo signals which is send back from the receiver sensors. PULSE signal from microcontroller measuring the time between the changes of logic HIGH and LOW, then store it to a variable.[2]

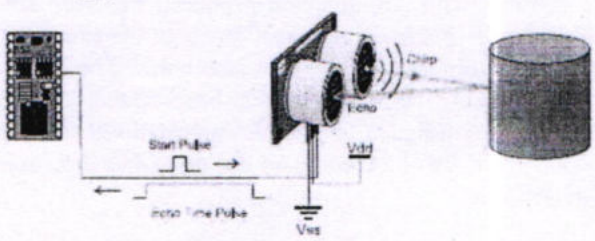

Fig. 1. Ping Ultrasonic Sensor

C. *Arduino*

Arduino UNO is a microcontroller board, has 14 digital input/output pins, 6 analog inputs, a ceramic resonator 16 MHz, USB connection, power jack, ICSP header, and a reset button. Arduino UNO contains everything needed to support the microcontroller, simply connected to a computer with a USB cable or AC-DC adaptor. Fig 2 shown the physical description of Arduino Uno.[3]

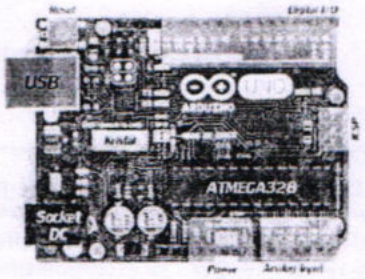

Fig. 2. Arduino Uno

D. *CMPS11*

CMPS11 is an electronic compass sensor from Devantech as 3rd generation. The module is equipped with a 3-axis magnetometer, 3-axis gyro and 3-axis accerelometer. In addition, this module has Filter Kalman which can be function to eliminate errors caused by the movement of PCB.[4] CMPS produces data output in the range 0-3599, representing 0 to 359,9 or 0 – 255. The output of 3 axis X, Y, Z is derived from the magnetic field components with the Pitch and Roll used to calculate bearing. The weakness of the compass sensor is the deflection. The deflection is the deviation of wind direction caused by the rotation of the earth and make sure that CMPS11 didn't located to any iron objects, because it would interfere the magnetic field and produce error in reading the degree of wind direction.[4]

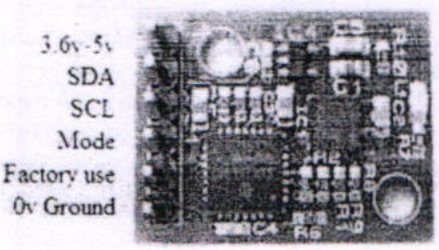

Fig. 3. CMPS 11

E. *DFPlayer Mini*

DFPlayer mini is an integrated module serial MP3 with WMV hardware decoding. This can be used as a stand-alone module with a battery, a speaker, a push button, embedded with an arduino UNO through RX/TX. Fig 4 shown the DFS Player Mini.[5]

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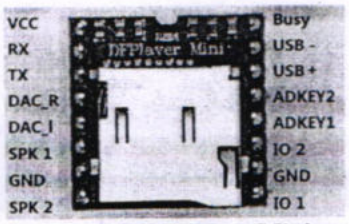

Fig. 4. DFPlayer Mini

F. Likert Scale and Procentage Category

The Likert Scale is a scale which is used to classify the variables and determining one's position in a continuum of attitudes toward an attitude object, ranging from the most negative to very positive position. [12]

Table. 1 Likert Scale [12]

No	Alternative answer	Abbreviation	Score (+)
1	Very Good	VG	75
2	Good	G	50
3	Not Good	NG	25
4	Bad	B	0

The Likert scale can be seen on table 1. The statements submitted are positive and negative statements assessed by subjects classified with very Good (VG), Good (G), not Good (NG), and Bad (B).
The validity of the result is measured by following formulas:[12]

Average Score = Total Score / Total of Item (1)

Where average score is the average value sought to obtain a percentage category. Total Score is the sum of the total value of questionnaire which is achieved by users in completing the questionnaire. The total of item means a number of questions on the questionnaire which is multiplied by a number of users who is filling out the questionnaires. After obtaining average value score, the value will be processed by the following formula to gain percentage of category value.

Percentage Score=(Average Score x 100)/Ideal Score (2)

Where the Percentage Score is the value to determine which category can be reach by the smart cane. The ideal score for this value based on Arikunto's assessment standard is equal with 70.[12] The percentage of category can be seen at table 2.

Category	Percentage
Good	76% - 100%
Fair	56% - 75%
Not God	40% - 55%
Bad	Less than 40%

III. DESIGN AND IMPLEMENTATION SYSTEM

A. Identification of Design

The research was beginning from conducting a questionnaire to the blind people about what kind of extension module that would be implemented on their cane. As the result of the questionnaire, they need an extension module that can help them to find the position of eight wind direction especially qibla position which embedded with the sensor module that can give them information through voice and sound.

Furthermore, we conducted a study of the literature in the library and read to other journals on similar research. According to whitney Huang [6] they made a smart cane with ultrasonic sensor that can give information to the blind people about the existence of obstacle around them through a vibrations handle while Mohd Helmy Abd Wahab [7] made a smart cane as assistive cane that can give information for blind people through vibration and voice. According to Prof.R.R.Bhambare [8], they made a smart vision that can give information about their surrounding area with embedded GPS on the system. Sung Yeon Kim and Kwangsu Cho [9] made a research on usability and design guidelines of smart canes for users with visual impairments. The latest technology came from a student from Birmingham City University Waheed Rafiq and Richard Howlett, [10] uses smartphone technology to recognize familiar faces from up to 10 meters away. The cane also features functionally to aid the navigation.
Based-on all the information above, this research will design an UID of prototype that differ from the previous design. On the previous design, the hitch module was package in one cane, meanwhile the new UID design of this research makes separated extension module that can be assembled with ordinary cane. This prototype will

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help them to find the position of eight wind direction especially qibla position which embedded with the sensor module that can give them information through voice and sound. The prototype UID will be placed the sensor on the top and the bottom of the canes. The module will be installed as a clip on methods on the canes. We identified the prototype system and analysis of the system requirement which can be seen at table 3.

Table 3. System requirement

No	Hardware	Description
1	Ultrasonic Sensor PING	Distance detection
2	Compass Sensor CMPS11	Detect Eight wind direction of compass
3	DFPlayer	Sound storage
4	Arduino UNO	Central control system
5	Power Supply	Supply power to the
6	On/Off Button	Activated system
7	LED	Indicator
8	Speaker	output sound
9	Buzzer	Sounding beep buzzer

B. Design of The System

We designed the prototype based-on table 1 above. The design system of prototype and the schematic diagram can be seen in fig.1 and fig 2. The compass sensor, DFPlayer mini and ultrasonic PING sensor embedded with arduino as an input whereas buzzer, led, and speaker embedded with arduino as an output sensor. Button on/off functioned to activate the system and also triggered the compass sensor.

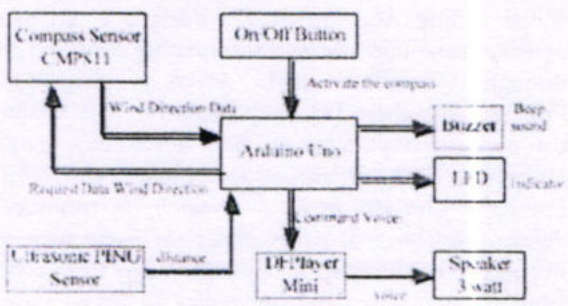

Fig. 5. Block Diagram System

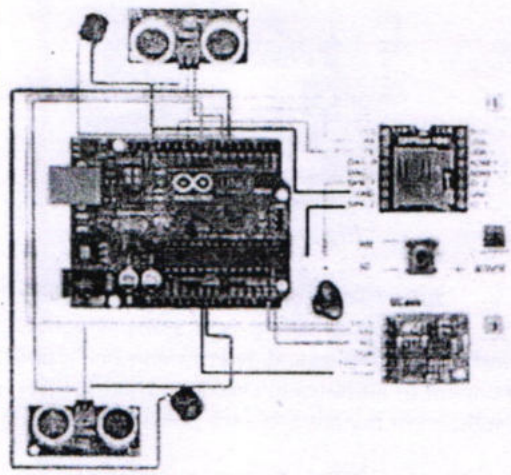

Fig. 6. Schematic Diagram

Based-on the flowchart on fig 7, when the first on/off button is pressed, it will activate the ultrasonic sensor. The beep sound will active if detect any obstacle, holes, hitch around the blind position from the distance 150cm until 3 cm, the speed of the sound beep will be faster when the blind people walk getting closer to the hitch or hole. Meanwhile if the user wants to find out the position where they were standing, pressed the second on/off button to activate the compass and the system (compass sensor will running) will give the information about their position through the speaker.

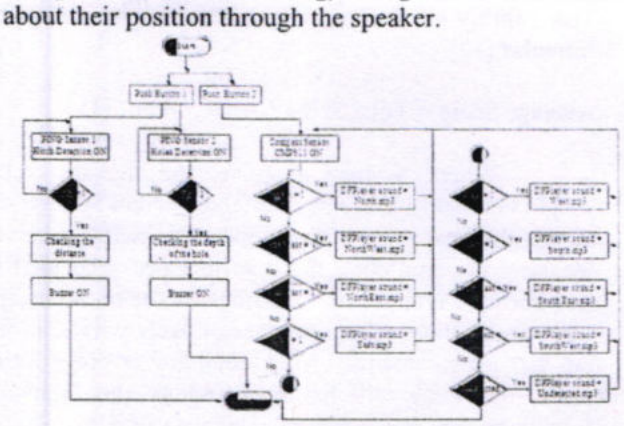

Fig. 7. Flowchart System

C. Implementation System

The Implementation User Interface Design on the prototype is the stage where the design of prototype is implemented on ordinary cane. On fig.8 and fig.9 we

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can see the User Interface Design of the blind cane. The compass sensor placed on top of the cane, while the hole and hitch detection placed on the bottom of cane.

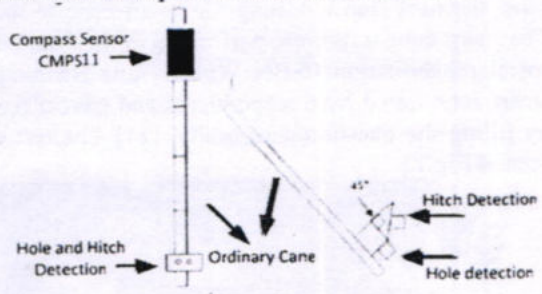

Fig. 8 Design and UID on Cane.

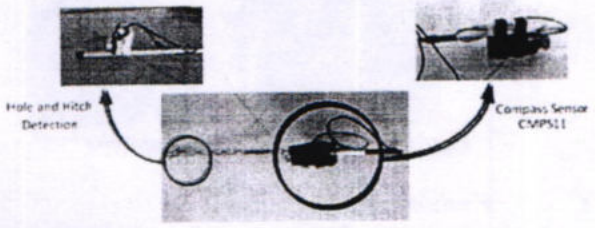

Fig. 9. Implemented Smart Guide Ekstension

IV. TESTING SYSTEM

A. Authors and Affiliations

After finishing designed the prototype, we do some scenario to test the prototype. The scenario are testing the hitch detection module, testing the holes detection module, testing the position of wind direction, and testing the UID of prototype.

The tested of hitch and holes detection can be seen at fig. 10 and fig.11. This test aimed to ensure that the design of the hitch and holes detection can work well.

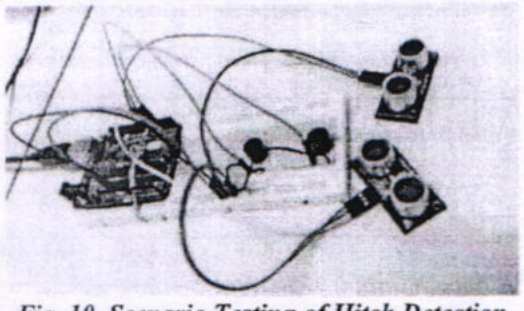

Fig. 10. Scenario Testing of Hitch Detection

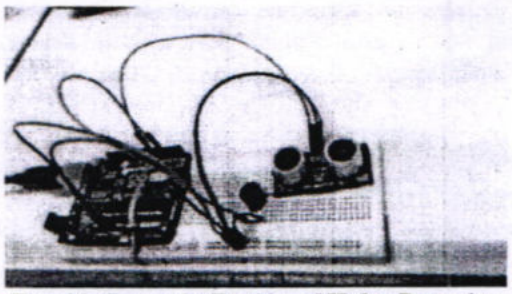

Fig. 11. Scenario Testing of Holes Detection

The testing result of hitch detection stated that the smart cane can detect any hitch around the blind people started form distance 150 cm until 3 cm. The speed of the sound beep stated from 1.1s – 0.3s. The result of the testing can be seen in the table 4.

Table 4. Hitch Detection Testing Data

Distance (cm)	Output	Speed Beep Sound (ms)
3 – 30	Sound 1 on	0.3
31 – 60	Sound 2 on	0.5
61 – 90	Sound 3 on	0.7
91 – 120	Sound 4 on	0.9
121 – 150	Sound 5 on	1.1
151 -	off	No sound

The testing result of holes detection stated that the smart cane can detects any holes around the blind people. The sound beep will be activated, if the canes detect a hole that has a depth from 10cm until 50 cm. The result of this testing can be seen at table 5.

Table 5. Holes Detection Testing Data

Depth (cm)	Output
3 – 9	No sound = off
10 – 50	Beep sound
50 -	No sound = off

The result of testing holes detection, stated that the sound will be active when detect a holes which has a 10cm – 50 cm depth. Fig. 12 is the figure of testing the position of wind direction. Analog compass is used as a determinant of the real direction of the wind. The compass module is testing on the track of 8 ways of the wind direction. While the system tested the CMPS 11 module, the system will generate a raw data in the form

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of degrees to determine the direction of the wind position. The result will compare with the degrees in the analog compass.

Compass module is designed by providing restrictions deviation angle until 30 degrees. It purposes to protect the user to keep in line on their track, so the user wouldn't get lost from their track to the destination.

Fig. 12. Scenario Testing of Position of Wind Direction

The result testing scenarios of compass module system can be seen in table 6. The response time to determine of wind direction is about 4.7s for deviation angle of 10-20 degrees and 5.5125s for deviation angle of 30 degrees. If the user made a move over than 40 outside the track, then the system will inform the user with a voice that "you are not in the right track." [11]. Qibla direction stated when the user finds the west direction of their position.

Wind direction	Deviation 1-2°	Result	RT (s)	Deviation 3°	Result	RT (s)
North (U) 0°	358°-359°	x	-	356°-359°	K	5.12
Northeast (TL) 45°	44°-46°	K	5.12	42°-45°-48°	K	6.12
East (T) 90°	79°-92°	K	5.53	79°-90°-93°	K	5.67
Southeast 135° (TG)	134°-136°	K	3.45	132°-135°-138°	K	4.3
South (S) 180°	179°-181°	K	4.32	177°-180°-183°	K	6.46
Southwest 225° (BD)	222°-227°	K	5.5	222°-225°-228°	K	6.03
West(B) Qibla 2700	2690-2710			2670-2700-		
Northwest 3150 (BL)	3120-3170			3120-3150-		

K = detected, x = undetected, - = no response time because the system cannot detect the direction, RT = response time

B. *Testing UID of Prototype*

After integrated the system to the conventional cane, the next step is testing the smart cane to the user. The smart cane tests were performed in the foundation of social rehabilitation PSBN Wyata Guna Bandung. The smart cane tested by 6 respondents and gave a feedback by filling the questionnaire orally. [11] The test can be seen at Fig 13.

Fig. 13. Testing the UID Prototype

C. *Evaluation of Prototype*

After testing UID prototype, we asked six users to fill out a questionnaire which is consisting of 10 questions. The questionnaire aimed to measure "how friendly" and "useful" the system which is embedded on the smart-cane. The result can be seen in table 7 below.

Table 7. Questionnaire

No	Questionnaire	Rating			
		VG	G	NG	B
1	The prototype informed you about the existence of the hitch	6			
2	The prototype informed you about the eight position of wind direction	2		4	
3	The process of the response time of smart cane is good and fast		2	2	2
4	The prototype informed you about the existence of the holes	6			
5	The position of the button is easy to use.	6			
6	The beep sound of the buzzer can be heard clearly		4	2	
7	The voice from speaker giving information heard clearly	6			
8	This prototype is easy to use.	2		4	
9	This prototype is heavy to lift		3	2	1
10	The user can distinguish the beep sound		4	2	
	Total point	2.100	750	400	0
		3.250			

*VG = very good, G – good, NG = Not Good, B = Bad

The result on the table above is processed by Likert Scale. Based on table 1 above, the first column (VG) has value equal with 75, second column (G) equal with 50, the third column (NG) equal with 50, and the last column (B) is equal with 0. All the total answer of the questionnaire of the column will be multiplied with the value of each column. The total score for this questionnaire is equal with 3250 and the total of item is equal with 60 (10 questions multiply with the number of user). The average score is 54.17.

$$Average\ Score = \frac{2100+750+400+0}{60} = \frac{3250}{60} = 54.17$$

After we calculate the average score, we calculate the percentage score of the questionnaire result. The Percentage Score for the smart cane based on the equation below is equal with 77.38%.

$$Percentage\ Score = \frac{54.17 \times 100}{70} = 77.38\%$$

Based on the table 2 above, we can categorize the smart cane into "Good" category. It means that this smart cane is on the level category of row 76% - 100%. [12] So that, it can be stated that this smart cane is friendly enough and useful for the user.

V. CONCLUSION

Based on the testing and analysis result, it can be stated that, the smart guide extension for blind cane can be implemented as an extension module for a conventional cane. The UID result testing categorized the prototype into "Good" category which means that the smart guide extension is friendly enough and useful for the user. Besides that, the system can be inform the direction to the user with response time to determine of wind direction is about 4.7s for deviation angle of 10-20 degrees and 5.5125s for deviation angle of 30 degrees. While the system reads the data over 40, the system will inform the user with a voice that you are not in the right track. The qibla direction is stated when the user finding the west position from the user.

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Smart Farming Using Arduion Technology

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Abstract: -- **-"Internet of Things" (loT) is a technology that allows things to communicate and connect with each other. This will change the patterns and processes in both industry and agriculture towards higher efficiency. Particularly, agriculture is an important foundation of Thai economy. Consequently, we propose an intelligent farming system (IF) to improve the production process in planting. IF composes of two main parts which are a sensor system and a control system. In this paper, we focus on the control part which are watering and roofing systems of an outdoor farm based on the statistical data sensed from the sensor systems (including temperature, humidity, moisture and light intensity sensors) Since the sensed data would not be always accurate due to noises, we apply Kalman filtering to smooth the data before using as an input in our decision making process. For the decision making process, we do not consider only the sensed data, but also the weather information. A decision tree model is generated to predict the weather condition. Then, a set of decision rules based on both the sensed data and the predicted weather condition is developed to automatically make a decision on whether watering and roofing system should be on or off. Moreover, we also provide functions for users to manually control the watering and roofing systems via our mobile application.**

Keywords- **Intelligent Farming; Smart Farming; Internet of Things; Wireless Sensor Network;**

I. INTRODUCTION

Agriculture is one of the important businesses that mainly affects the mankind life. From the ancient to the agricultural revolution in Great Britain England, farming is the way that human used to harvest plants and consumed them in their daily life. Farming has been improved by many technologies supporting cropping system. In addition to the technologies in the agricultural revolution era, there have been many technologies that have impacts on agriculture such as harvest machine, seed drill machine, reaper machine, and the others that can reduce manpower and wasting time. Recently, Internet has involved in people's daily activities. Internet has been widely used to connect people together, people with devices, or devices with devices. In an electronics device, it is embedded by software and sensors for using to commutate and to exchange data with other devices and people. When millions of devices are connected together through the Internet, this is called Internet of Things (loT). loT encompasses many new intelligent concepts for using in the near future such as smart home, smart city, smart transportation, and smart farming.

Recently, there are few research works on smart farming .In [1], a wireless sensor network is used in potato fields in Egypt. The proposed system is used to monitor the potato fields such as looking for diseases and harmful fungi and record useful information for improving future planting and managing resources such as water and soil. In Thailand, agriculture is also massively important for Thailand'S economy. Particularly, the agriculture section has contributed 8.4 percent to Thailand'S GDP. Then, to increase the crop yield, the smart farming technology would help.

In this paper, we have proposed an intelligent farming elF) system. IF is the technology that uses the concepts of loT and smart farming to help farmers to monitor and sense useful information from their farms in order to help in the quality improvement and product quantity. Our Intelligent farming system consists of two main parts. The first one is a sensor system, including temperature sensor, humidity sensor, moisture sensor and light intensity sensor. The second part is a control system. In this paper, we focus on the control system. Our control system has two main subsystems which are watering and roofing subsystems. The system uses the statistical data collected from the sensor system and the weather information to make a decision to control the farm environment. Particularly, the statistical data is collected from sensors. We then apply Kalman filtering

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theory to make the data more accurate since there can benoice collected from sensor (errors sensed by sensors). To support outdoor farming, not only the sensed data but also weather information from an external source is also considered. Weather information records in a planting area are retrieved from a weather forecast repository. Then we generate a decision tree model to predict the weather condition (either "no rain", "rain", or "storm") by using historical weather data <including temperature, humidity, pressure at sea level and wind speed). Finally, our proposed decision rules are set up based on the smooth sensed data and predicted weather condition. Our watering and roofing subsystems can be automatically turn on or off based on the decision made by the rules. However, it is possible to let users manually control the watering and roofmg subsystems via a mobile application.

II. SYSTEM ARCHITECTURE AND FUNCTIONS

Fig. 1 shows our proposed IF. In IF, the sensor subsystem is a set of tools and sensors that are connected to a microcontroller board called Arduino board. Sensors are used to measure essential values of the planting process including temperature, humidity, moisture and light intensity. The sensed values are then uploaded to the server by using a Wi-Fi module integrated on the same Arduino board. On another part, the control subsystem is a set of devices used to control the roofing subsystem and watering subsystem. The roofing and watering subsystems can be automatically open or close according to the decision from our proposed decision tree model (described in Section III). Also, the roofing and watering subsystems can be manually controlled by a user via our mobile application. Moreover, there is a notification system used to provide the user the current farming status and also ask for the response from the user to an important event such as when the plants need water and the temperature is tending to high. If the user does not have any response within a limited time. The system will work automatically.

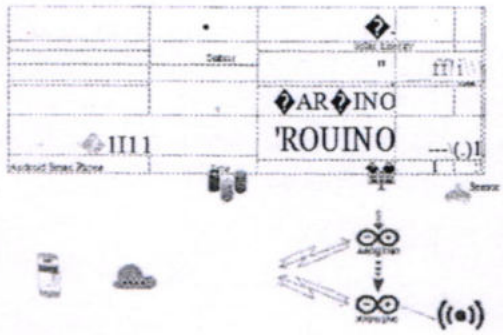

Fig. I A system architecture of the system

III. A PROCESS FRAMEWORK FOR OUR CONTROL SYSTEM IN IF

In Fig. 2, there are five steps for our process framework of our control system in IF. The details of each step are as follows:

A. Acquiring data from sensors

This stage is to sense raw data from sensors. The raw data from the sensors ranges between 0 and 1023. Each sensor has its own method to convert the raw data to be a voltage value However, the main problem in this stage is that the sensor node would not be always precise due to noises remove the noises, we apply Kalman filtering to filter out the noises and smooth the sensed data as described in Section III-B.

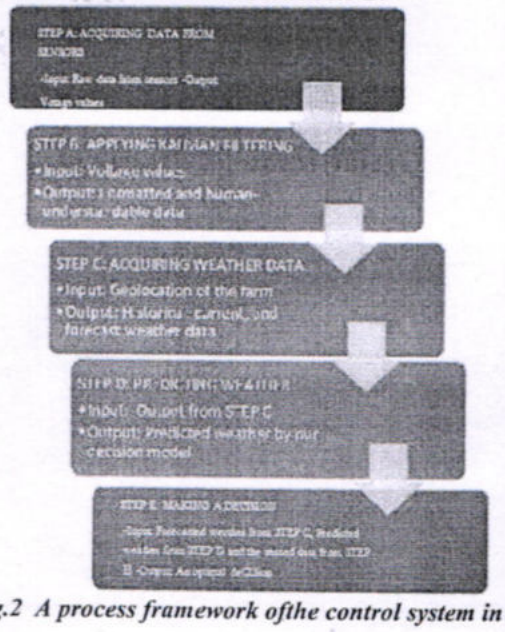

Fig.2 A process framework ofthe control system in IF

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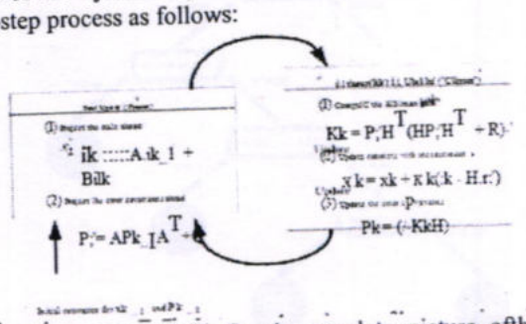
In this stage, Kalman filtering [4] is used to estimate real values interfered by noise generated from the imperfect sensors or land inaccurate sensors measurement. From Fig. 3, the main process of Kalman filtering is a recursive process which uses a previous state and current estimated state to get the more precise state of the dynamic system. The algorithm works in a two-step process as follows:



from the sensors. ToFig.3 A complete picture ofthe operation of the Kalman filtering

1) Prediction step: In this step, first the Kalman filtering addresses the general problem of estimating the state by the linear stochastic difference and with covariance Q to the time k. From our experiment, we have found that the proper value of the process noise is 10-8 Then, we will estimate the current value and the error covariance matrix at time k which is given by: and

PI; = APk_1AT + Q (2)

where PI; represents the error covariance of prediction which is used to estimate how much we can trust the values of the current estimated state. In this case, we assume that the first error covariance L is set to be one which is a large number for representing the error covariance. Correction step: When the sensor sends data to the system, the measurement Zk will be used to compute the observed value of the measurement which is given by:

Zk = HXk + Vk (3)

The noise of the measurement Vk has to be Gaussian distributed. Our value of the measurement noise is derived from using "standard deviation" of the observed value during the calibration. The diagonal values of the matrix Rk (as the covariance) are 0.3377159, 0.0050016, 0.0098983, and 0.0005383 which are the covariance of humidity, light intensity, temperature, and moisture, respectively. Then, the system will compute the difference between the measurement Zk and the priori state xl; . This is also called the innovation Yk : (4)

Yk = Zk - HXk

and the innovation covariance SK is shown below.

SK = HPI;HT + R (5)

The next step is to calculate the Kalman gain KK. The Kalman gain is used to indicate how much we can trust the innovation which can be computed by the following equation.

KK = PkHTSI;l (6)

Now we have to update the posteriori estimate of the current state:

$$P_k = (I - K_k H)P_k^-$$

The final output Xk is the estimated value of the sensor data which is more precise and accurate. Then the value will be transferred to the database as a smooth values of the sensed data.

C. Acquiring Weather Data

Our control system also acquires the weather data, including historical, current, and forecasted weather, from Openweathermap.com to use as the conditions for making a decision. A user can see the weather information via the mobile application where we inquiry the next 3-day weather forecast to be shown.

D. Predicting Weather

The historical weather data is now used to model a decision tree [5] for predicting the weather condition as "no rain", "fain or storm". The decision tree model is generated by using a machine learning library for nodej s [6]. Fig. 4 shows our decision tree to predict the weather condition.

E Making a Decision

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In Fig. 7, the sinusoidal line represents the measurement values of light intensity sensor which has the data in range between 10-40 lux due to the voltage noise. On the other hand, the almost straight line in the middle of the graph represents the estimated values from the Kalman filter which is 28 lux. Note that the real light intensity in the experiment is around 30 lux.

TABLE II shows an example of the predicted weather condition compared with the real condition. We can see that the results from our decision tree is accurate.

TABLE II EXAMPLE DECISION VS REALITY

Date	Most Result from Decision tree	Reality	Input Conditions
2016-02-20	"no rain"	"no rain"	Temp 29.35, Humid 72.5%, Moist 50.21%, Light 1072.79 lux, Forecast "Clear"
2016-04-14	"no rain"	"no rain"	Temp 27.08, Humid 40.84%, Moist 86.96%, Light 973.81 lux, Forecast "Clear"
2016-04-18	"no rain"	"no rain"	Temp 32.69, Humid 59.69%, Moist 74.91%, Light 60.43 lux, Forecast "Clouds"

V. CONCLUSION

We have proposed a control system for an intelligent farming for an outdoor farming, called IF. To make a decision, the model requires two important information pieces which are the sensed data from the sensors in the plot and the weather condition. To smooth the sensed data, we have applied Kalman filter to remove noises. Also, we have generated a decision tree model to predict the weather condition. Based on this information, we have set up rules for making a decision in our control system on whether watering and roofing system should be on or off Moreover, we have also provided functions for users to manually control the watering and roofing systems via our mobile application.

Acknowledgement

The work was supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU59 Grant No.59000399) and National Electronics and Computer Technology Center (NECTEC) under the National Science and Technology Development Agency (NSTDA), Thailand.

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Smart Controller Fed Non Conventional Microgrid for Optimal Power Distribution*

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Abstract

This Paper proposes the smart controller SUG to achieve system reliability and optimal power distribution. Control targets were acquired by mixed application of various strategies, such as Micro-grid peak load shifting be used to reduce State Utility Grid (SUG) supply pressure, SUG connection be controlled flexibly to maintain Micro-grid load working reliably, Micro-grid power production and load supply demands of SUG and Micro-grid be predicted to plan battery energy storage in advance, actual monitoring date be used to control overcharge and over-discharge, State of Charge (SOC) be managed to realize battery efficient storage and full life cycle as far as possible. All designs were integrated with forecasting and monitoring data from different locations of Micro-grid supply side and demand side, the SOC of storage system.

Selection and Peer-review under responsibility of International Conference on Processing of Materials, Minerals and Energy (July 29th – 30th) 2016, Ongole, Andhra Pradesh, India.

Keywords: Wind photovaltic storage, Microgrid, Information Fusion, Peak Load Shifting, State Utility Grid.

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Selection and Peer-review under responsibility of International Conference on Processing of Materials, Minerals and Energy (July 29th – 30th) 2016, Ongole, Andhra Pradesh, India.

1. Introduction

As a new alternative energy, small wind and solar complementary generation system is always operated in Micro-grid island mode, also as a distributed generation technology used in group buildings [1]. The use of wind and solar complementary power can solve problems to a certain extent of environmental pollution and energy exhaust caused by the use of traditional energy sources, but the unique uncertainty and randomness of wind and solar generation power create major obstacles to the power generation and supply demand management[2], which show inherent shortages of centralized control or distributed control, wind and photovoltaic Micro-grid system is difficult to provide continuous and stable energy output [3]. There are hybrid systems appeared in existing literatures integrated with energy storage device. However, due to the battery own characteristics, such as capacity and life, system cost and efficiency of wind and solar power generation are affected [4].To improve the efficiency of the system, mixed control structure is used under reliability constraints [5]. By predicting the wind speed and solar radiation per-hour, thus the rational capacity allocation of hybrid power system is done, so improving reliability and reducing cost [6]. The energy storage system is undoubted the preferred mode of distributed generation of energy regulation, the key technology related battery life closely is the battery charge and discharge methods and strategies [7]. Charge and discharge management of battery is essential for reliable and stable operation of wind and solar Micro-grid system. Literature [8] proposes a hybrid energy storage structure consisted of ultra-capacitor and battery, which can prevent battery from too large charge and discharge current resulting from power fluctuations and keep battery in an effective service life. To meet user more needs and improve the efficiency of the system, a more reliable charge and discharge control system must be used as a support [9].

In general, Wind/ Photovoltaic Micro-grid storage technology appeared in literatures are mostly focused on single function of maximum power tracking or analysis of battery capacity or operation method. Few are focused on proactive energy storage planning from the angle of the multi-objective control, such as battery charge and discharge protection, reliable power supply of Micro-grid load and peak load shifting, so as to achieve flexible and efficient control. In this context, the subject of intelligent control research is expanded on Wind/ Photovoltaic Micro-grid storage systems. According to SUG (State Utility Grid) load forecasting and Micro-grid power generation and load demand prediction as well, multi-information fusion concept of intelligent control is introduced. Stage planning is done for battery charge and discharge within the next 24 hours, solving the shortage problem of power generation of Micro-grid that may be happened during the future peak time of SUG load. So peak load shifting to valley and stagger supply power away from SUG peak is achieved under SUG connection, relieving the SUG supply pressure. At the same time, according to the Micro-grid power production forecast, a further SOC is predicted effectively to prevent battery from overcharge or over-discharge, thereby extending battery life.

2. Wind/ Photovoltaic Storage System Topology

Wind/ Photovoltaic storage power generation system consists of five functional blocks in Fig. 1. From the point of view of energy flows, there are multiple path divisions. The first is complete energy transmission from Wind/ Photovoltaic complementary power generation to Micro-grid load. The second is from Wind/ Photovoltaic complement power generation to battery energy storage system. The third is from the SUG to Micro-grid load. The fourth is two-way bi-direction power transmission from SUG to battery storage. The fifth is from Wind/ Photovoltaic complementary power generation to the SUG. According to the system function module structure analysis, the topology diagram designed is as shown in Fig. 1, Wind/ Photovoltaic complementary power generation supplies local Micro-grid load through the DC/AC converter. Battery is given an access to DC bus by DC-DC converter. As can be seen from the figure, to achieve energy management and intelligent control, monitor equipment must be placed firstly at the different locations, such as output port of DC-DC converter of Wind/ Photovoltaic power, the output port of storage system, the port of Micro-grid load, the port of SUG. So Wind/ Photovoltaic power generation production, SOC of battery, load supply demand and SUG parameters are monitored. Then based on the each monitoring parameter, combined with relevant forecasting data, information fusion is used to control battery charge and discharge and SUG connection flexibly by the intelligent controller in Fig. 2..

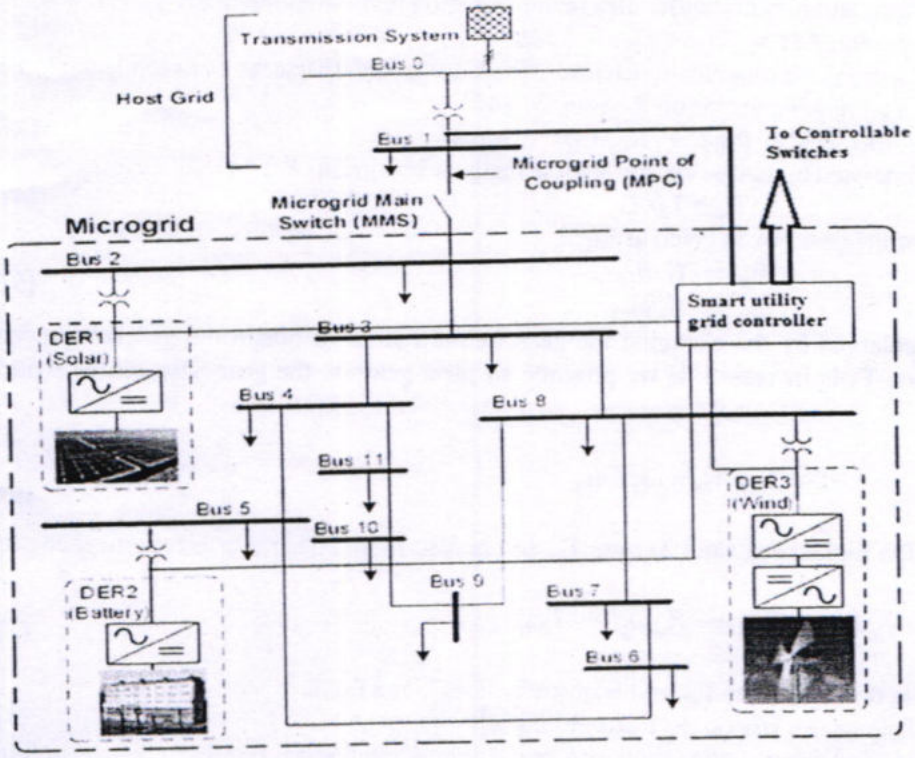

Fig. 1. Hybrid systems of wind/photovoltaic/Battery topology schematic

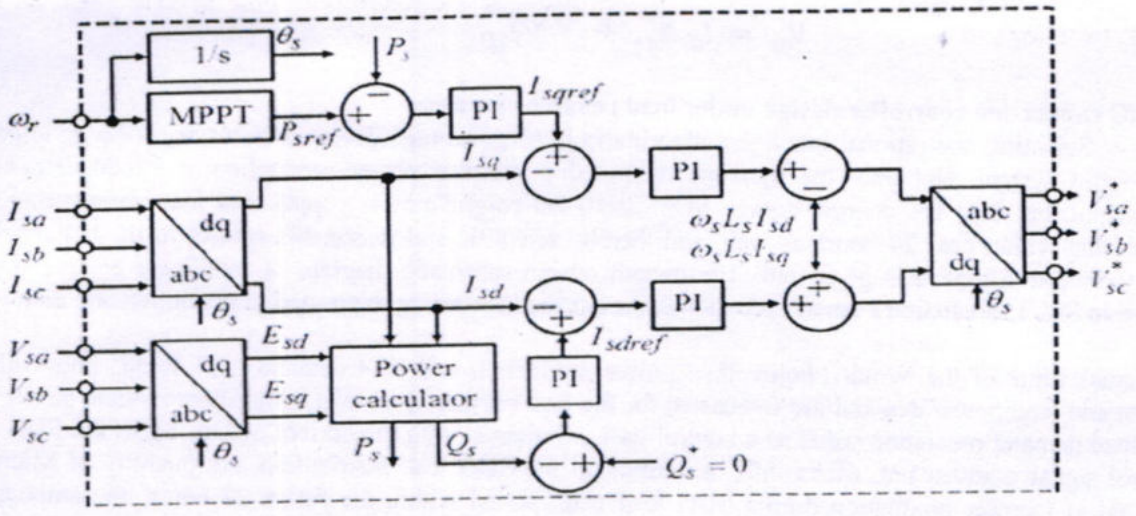

Fig.2. Simulation Model of WECS

3. Statistical Formulation of Wind Turbine representation

The mechanical power output from wind turbine is given as in Eq. 1.

$$P_m = \omega_r[J.d\omega/dt] + P_e \quad (1)$$

The Wind Turbine drive train based on 2 mass models is utilized in shaft modelling analysis. Driving by the

dynamic torque T_d, the wind turbine rotor rotates at ω_r and the braking torque is represented as T_{lb}. The dynamics of rotor is characterized by the state equation in first order differential equation representation in Eq. 2.

$$J_r \, d\omega_t/dt = T_d - T_{lb} - k_r \omega_t \quad (2)$$

The low speed shaft results T_{lb} from the torsion and friction effects due to the difference between x_t and the low-shaft speed x_{lb}. This torque act as a breaking torque on the rotor in Eq. 3.

$$T_{lb} = B_{lb}(\theta_t - \theta_{lb}) + K_{lb}(\omega_t - \omega_{lb}) \quad (3)$$

The torque on high shaft is generated by torque on low shaft using gear box in Eq. 4.

$$T_{hs} = T_{ls} / G \quad (4)$$

Pitch angle and pitch speed of the gear box is given as Eq. 5.

$$\theta_a = G.\theta_{ls} \qquad \omega_a = G.\omega_{ls} \quad (5)$$

The low shaft speed ω_{ls} is enlarged by the changing the gearbox ratio so as to obtain the generator speed ω_g, while the low-speed shaft torque T_{ls} is increased. If we presume an ideal gearbox the gear ratio can be written as Equ. 6.

$$G = T_{ls} / T_{hs} = \omega_g / \omega_{ls} \quad (6)$$

The generator is driven by the high-speed shaft Torque T_{hs} and braked by the generator electromagnetic torque T_{em}

$$J_g \dot{\omega}_g = T_{hs} - K_g \omega_g - T_{em} \quad (7)$$

The electromagnetic torque is represented as T_{em} and is given by Eq. 7, and Eq. 8.

$$T_{em} = \dot{-} \left[E_R i_R + E_Y i_Y + E_B i_B \right] \quad (8)$$

In an Linear model the voltage and flux equation with respect to stationary reference frame is given as in Equ. 9.

$$V_{ds} = I_{ds} R_{ds} + {}^{d\varphi_{ds}}/_{dt} \qquad V_{qs} = I_{qs} R_{qs} + {}^{d\varphi_{qs}}/_{dt} \quad (9)$$

4. SUG connection controller design under load reliable operation

Scientific and rational intelligent algorithm of energy storage device is necessary for a good performance Micro-grid system. Not only the dynamic relationship between power production and load demand must be considered, but also the energy storage SOC itself, Micro-grid power supply and load forecasting, SUG load forecasting within next 24 hours as well, and thereby scientific and reasonable control to the battery storage and SUG connection device is given out. The overall design schematic diagram of intelligent control strategy is as shown in Fig. 3. Prediction error at each moment is adjusted according to pre-period prediction and monitor.

Actual value of the Wind/ Photovoltaic power production and load demand, and Wind/ Photovoltaic power output and load power demand are forecasted for the next period. Then take Wind/ Photovoltaic power production and load demand prediction value as a control basis, combined with the current battery SOC, the SUG connection control signal is given out. Meanwhile, according to the SUG load distribution and quantity of Micro-grid load demand and power production during SUG load peak period within the future 24 hours, the amount of energy needed to be stored in advance is planned during SUG valley load period.

5. THD ANALYSIS

The Total Harmonic Distortion is analyzed in MATLAB/SIMULINK either by using two Discrete Fourier blocks allow computation of the fundamental component of voltage and current while simulation is running or by using

FFT tool of Powergui to display the frequency spectrum of voltage and current waveforms. Analyzing THD by Discrete Fourier blocks is not an Convenient method. Therefore FFT tool of Powergui is used for the analysis of THD.

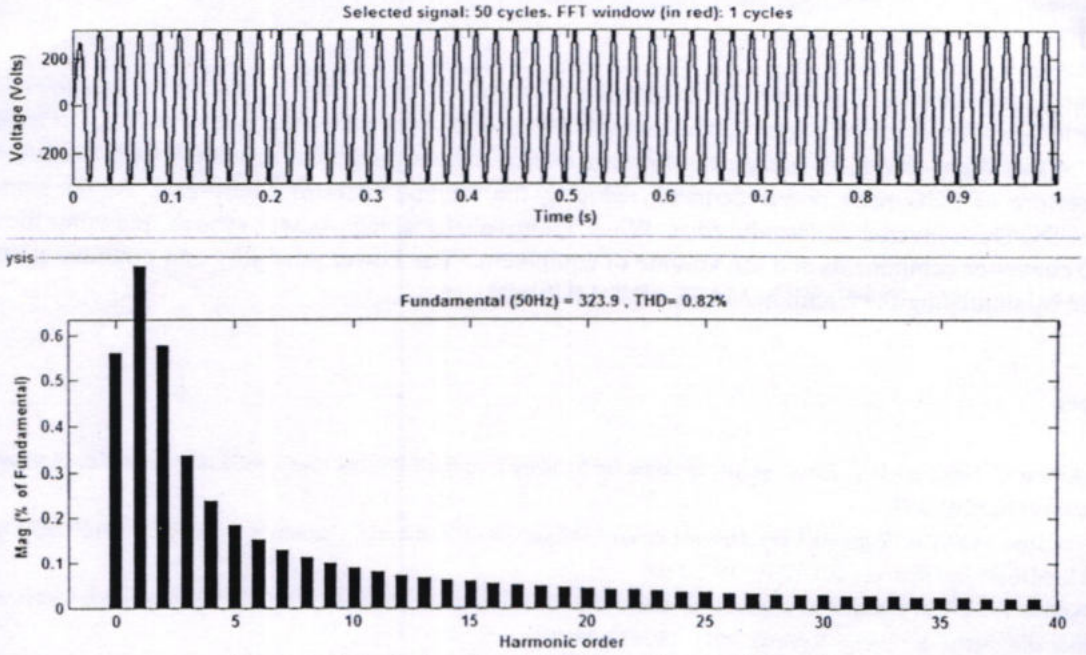

Fig. 3. THD Analysis on Converter Section without ideal Controller

The Fig. 3. Shows the Simulation result of THD analysis over the Converter Section with an SVPWM controller and it is found that the converter output is 323.9V at fundamental frequency with a Total Harmonic Distortion of 0.82%.

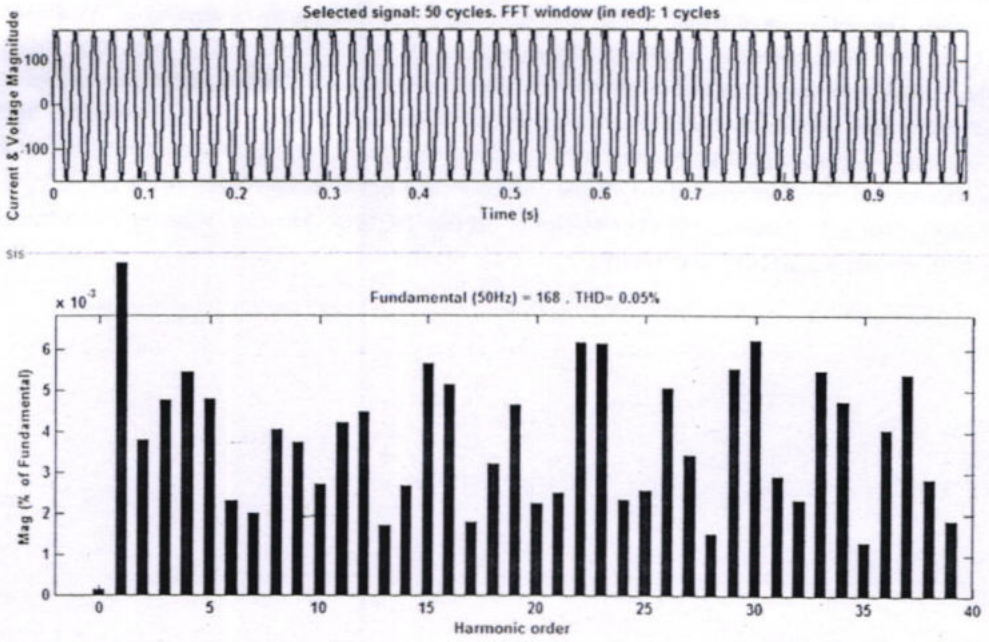

Fig. 4. THD Analysis on Grid Side with SUG Controller

The Fig.4. shows the Simulation result of THD analysis over the Grid Section with SUG Controller and the total Harmonic Distortion of 0.05%. The Fig. 3. & fig.4. Shows the Simulation test results of THD analysis on per phase current on islanded Grid system with SUG controller. The Current output is 18Amps with a THD of 0.71% and

voltage of 325 Volts at fundamental frequency with a THD of 0.73%The Fig. 4. Shows the Simulation test results of THD analysis on per phase Voltage on islanded Grid system. The Simulation is done by FFT tool of Powergui and by looking at the result it is clear that the frequency spectrum of voltage and current waveforms are present. The Current output is 325 Volts at fundamental frequency with a Total Harmonic Distortion of 0.73%.

Conclusion

It has been analyzed that the controller can perform several functions, such as trigger SUG connection flexibly according to Micro-grid actual power production and load supply demand, integrate with SOC to ensure reliable operation of the Micro-grid load. Local peak load are moved to valley segment to achieve peak shifting to ease the supply pressure of SUG peak power demand, reducing the running costs of Micro-grid. At the same time, bi-directional DC/DC converter is introduced to Wind/ Photovoltaic/Storage power system, reducing the number of electronic converter components and the volume of equipment. The Power reliability and optimum power solution is obtained by simulating the circuit in MATLAB/SIMULINK.

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Smart Bus

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Abstract— **This is an automated system which will be fitted in the Bus for cleaning the dust particle from environment.The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. In this system Microcontroller is the main unit, which controls the whole process. We are going to use AVR family microcontroller (ATMEGA 8/ ATMEGA 16). Vacuum Cleaner is used for cleaning the dust particle from road, which is connected with microcontroller. There is a container for containing the dust particle. We are going to use IR sensor for detecting the quantity of dust particle in container. IR sensor will be fitted on the top of container. When the container will be filled with dust container, then the sensor will detect it and send information to microcontroller. The sensor will be connected with Microcontroller .There will be one alert system for giving alert when the sensor will detect the quantity of dust. There will be one manual switch, which will be used for opening and closing of the container. Motors will be fitted on the top of container for opening and closing container.solar panels are placed on roof of the bus for power supply**

Keywords:-. **Manual Switch. Microcontroller. Container.**

I. INTRODUCTION

The proposal aims at designing a unique system which can be controlled automatically for cleaning dust particles from road by using microcontroller.The Vacuum cleaner and sensors. This proposal use to automatically clean of dust particle from road public means, where vacuum cleaner is present for sucking the dust particle from road and store it on a container. When Container will be filled, then the system will give alert. There will be one switch on the system for opening and closing the container. The system is automatedprocess, which is controlled by microcontroller unit. Sensors are used for detecting and vacuum cleaner is used for sucking the dust particle. The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. We are using AVR family microcontroller (ATMEGA8/ATMEGA16), which controls the whole unit. To detect the quantity of container the IR sensor plays a major role. IR sensor is connected to microcontroller in order to send the alert signal Motor is fixed on the side of the container which helps it to open and close. Vacuum cleaner is an existing product.

II.LITERATURE SURVEY

According to the survey of 2015-2016, the number of peoples travelling in public means is around 50 lakh in Bengaluru city. For instance ,BMTC busses not only serves as public transport.but also provides its exclusive services to other organizations like IT companies .Educational institutions,IT Tech parks,etc. Hence high percentage of people are dependent on BMTC.

III. EXISTING SYSTEM

1. Vacuum Cleaner.

A vacuum cleaner, also known as a sweeper, is a device that uses an air pump (a centrifugal fan in all but some of the very oldest models), to create a partial vacuum to suck up dust and dirt, usually from floors, and from other surfaces such as upholstery and draperies.

2.GPS tracking system.

A GPS tracking unit is a device, normally carried by a moving vehicle or person, that uses the Global Positioning System to determine and track its precise location.There are two types of GPS tracker system. car tracking system the data pullers and data pushers. The way these things operate are different but the end result is similar, you come to know where your car had been and where did it stop for how long, what direction it took and how fast it drove. all the data from these car tracking system in India. GPS tracker systems in India like Delhi, Mumbai, Jaipur, Chennai, Bangalore and many more.

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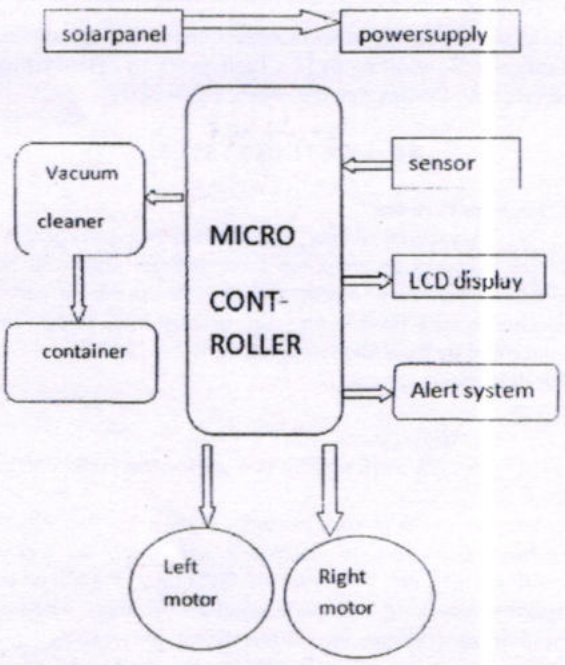
IV. PROPOSED SYSTEM

The system is designed for four wheeled Vehicles. The system is Fixed – Adjacent to the energy storage system. For power consumption we use solar battery.IR sensor isfitted on top of the container which senses and give signal to driver. The driver will dump the garbage in particular area. By this process we can keep the city roads clean. So 30% of our city can be kept clean. Even in rainy season .the sensor fixed in the container detects the wet particles. It sucks the both dry and wet particles. Using thekinetic energyproduced by the vehicles energy can be generated and used for vacuum cleaner instead of using stored energy .

V. BLOCK DIAGRAM



VI.WORKING PRINCIPLE

Our proposed system consists of micro controller which controls the whole process. The system will be fitted on bus, where vacuum cleaner is present for sucking the dust particles from road sides and store it on a container. When container is filled, then the system will give alert signal to driver there will be one switch near to the driver for opening and closing the container. The system is an automated process, sensors are used for detecting and vacuum cleaner is used for sucking the dust particles. Here we use microcontroller-ATMEGA8/ATMEGA16. IR sensor,vacuum cleaner,beeper,power supply,flash programmer as hardware requirements and AVR studio. embedded C, MATLAB, sinaprog as software requirementsAVR studio is the platform where we will write the code and compile the code for validation.Sinaprog is the platform in which we will jump our code from PC to microcontroller

6.1 Components Required

Fixed resistor-Resistor is a passive component used to control current in a circuit. Its resistance is given by the ratio of voltage applied across its terminals to the current passing through it. Thus a particular value of resistor, for fixed voltage, limits the current through it. They are omnipresent in electronic circuits.The different value of resistances are used to limit the currents or get the desired voltage drop according to the current-voltage rating of the device to be connected in the circuit. For example, if an LED of rating 2.3V and 6mA is to be connected with a supply of 5V, a voltage drop of 2.7V (5V-2.3V) and limiting current of 6mA is required. This can be achieved by providing a resistor of 450 connected in series with the LED.

Resistors can be either fixed or variable. The low power resistors are comparatively smaller in size than high power resistors. The resistance of a resistor can be estimated by their color codes or can be measured by a multimeter. There are some non linear resistors also whose resistance changes with temperature or light. Negative temperature coefficient (NTC), positive temperature coefficient (PTC) and light dependent resistor are some such resistors. These special resistors are commonly used as sensors.

Capacitor- A capacitor is a passive two terminal electrical component used to store energy in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors separated by a dielectric (insulator); for example, one

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common construction consists of metal foils separated by a thin layer of insulating film. Capacitors are widely used as parts of electrical circuits in many common electrical devices.When there is a potential difference (voltage) across the conductors. a static electric field develops across the dielectric. causing positive charge to collect on one plate and negative charge on the other plate. Energy is stored in the electrostatic field. An ideal capacitor is characterized by a single constant value, capacitance. measured in farads. This is the ratio of the electric charge on each conductor to the potential difference between them.The capacitance is greatest when there is a narrow separation between large areas of conductor. hence capacitor conductors are often called "plates." referring to an early means of construction. In practice. the dielectric between the plates passes a small amount ofleakage current and also has an electric field strength limit. resulting in a breakdown voltage.

Transistor -When we talk of transistor in robotics, we talk about the cut off andsaturation region only, while in your course you study transistor in activeregion. So here I am talking about transistor as a switch. When we saytransistor as a switch. we talk of cut off or not because the typical cut off Voltage is around 5V and the saturation voltage (vbe) is around 8V. Thereare regions between them. Let's start with transistor to glow an LED. Connect this circuit and see. Connect multimeter at the base of the transistorand see the voltage. In this circuit we can see that Ve=Vbe. For the transistor to be switched ON Ve=.5V. Vary the potentiometer to makeVbe=.5V, you can see that LED starts glowing(but it is less brightness).Vary the potentiometer to make Vbe to around .8V , you can see that theLED brightness increases. This is because when Vbe=.5V it starts with cut off and when Vbe=.7V in active and Vbe=.8V it become saturation region.Transistor is a current controlled device. In active region Ic=hfelb and insaturation region Ic>hfelb. That is why the brightness of the LED changes.

VII. ADVANTAGES

It creates Eco friendly environment. Automation system for cleaning of road(no human effort for cleaning road). Less cost for cleaning city than manual human effort. .City can be kept clean.

VIII. FUTURE ENHANCEMENT

Separation of dry and wet particles which is in the container. The trash collected wet particles can be recycled and used for agriculture.Smart dustbin can be used.

IX. CONCLUSION

It is impossible to clean the city roads. Cleanliness can be done by transportation means. The project is aimed to design and implement to where less manual power is used for cleaning city which is an automatically cleaned by Buses. it important for facility heads to primarily understands the need for professional cleaning equipment as an essential pre- request for better work environment so one of the most common equipment used for commercial application in any premises is the vacuum cleaner. ecofriendly Environment, automation system for cleaning of road .less Cost for cleaning city than manual human efforts.

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Sanjeevani Drone

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Abstract— **A Hexadrone also called as a hexarotor helicopter or hexacopter, is a multirotor helicopter that is lifted and propelled by six rotors. hexacopters are classified as rotorcraft. It is used for social cause, like flood such natural disasters. By using this drone we can easily distribute food, medicine, safety guards to the needy people. The maximum needy stuff that a drone can carry up to 2kgs. It has multidirectional navigation. Using GPS we can trap the drone through android app.This vehicle is highly capable to fly soon and reach any place in a very possible time. so using this we can control the hunger and can safe guard the people from some contagious diseases.This project is used to provide user friendly service in natural disaster emergency. This project have 2 modules. One will be placed in accessing unit and other will be placed on drone.Accessing unit will be having control to direct the drone to reach the respective area where help is needed,With the necessary information from management. Then the drone picks up the needy stuffs and moves towards needy people. The drone location will be tracked by using ARM, GPS and GSM module.ARM activates the GPS to read location of the place with respect to Latitude and Longitude. Then ARM sends that location information to concern person via GSM to track drone.We fix the camera on the drone to shoot the footage from the sky and that footage will be available as live streaming in the LCD.**

I. INTRODUCTION

hexacopter, is a multirotor helicopter that is lifted and propelled by six rotors. hexacopters are classified as rotorcraft. It is used for social cause, like flood such natural disasters. By using this drone we can easily distribute food, medicine, safety guards to the needy people. The maximum needy stuff that a drone can carry up to 2kgs. It has multidirectional navigation. Using GPS we can trap the drone through android app. This vehicle is highly capable to fly soon and reach any place in a very possible time. We fix the camera on the drone to shoot the footage from the sky and that footage will be available as live streaming in the LCD.

II. LITERATURE SURVEY

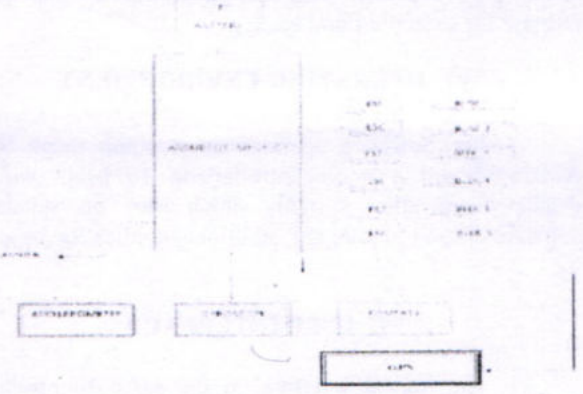
US forces ready a Pioneer drone during Gulf War 1991.Israeliaerospace 'maverick' Abraham Karem inventedthepredator drone' in 1974.The Oxford English Dictionary describes drones as a remote- less controlled piloted aircraft or missile'.on February 4, 2002, that the CIA first used an unmanned Predator drone in a targeted killing.Supplies of basic necessities, including milk, water and vegetables, were affected due to logistical difficulties.

III. PRODUCT DESCRIPTIONS

A. Product Perspective:

The main use of our product is we use in the natural disaster purpose for helping peoples. Our product is a replacement for an existing system, as we know that during flood many people affected . The Hexa -copter which we have designed is too help the people during the flood like providing food, firstaid ,etc.this is been accessed by joy stick.

B. Block Diagram



IV. PRODUCT FUNCTIONS

We have already mentioned the main components in the above block diagram. At first any user must connect to WIFI secured with WPA2 in android based mobile so that he can connect and then operate with our SANJEEVANI Drone. Li-Po rechargeable battery is connected to run motors. We use ARDUINO mega 2560 which helps in interfacing the app with the motors of drone that is interfacing software with hardware. An android app is interfaced with the ARDUINO mega board through Wi-Fi module. The ARDUINO MEGA-2560 is a 8-bit processor, 16MHz clock speed .This Arduino board can be programmed using the Arduino software (IDE). The accelerometer will measure the acceleration forces and the

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acceleration forces may be static or dynamic. We use an accelerometer + gyroscope (IMU) is connected to hardware system and interfaced with Arduino board. Gyroscope is a sensor which gives output to Arduino board and maintains the orientation of the drone. The gyroscope helps in balancing and stability of drone by giving values of x, y, z. GPS UBLOX NEO 6M is cost effective and high performance and helps in initializing the location of crop yield. We used an immersable pump which is immersed inside the fertilizers tank it then pumps the fertilizers and sends to the sprinkler to spray.

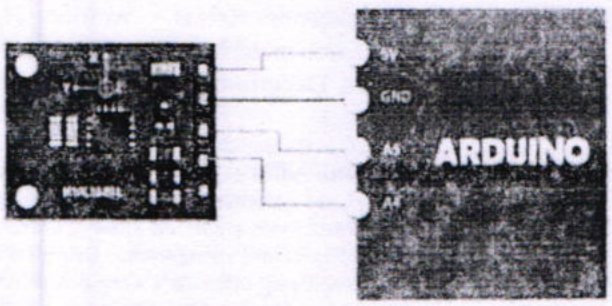

Fig 1. Arduino interfaced with hmc5883l

V . USER CLASSES AND CHARACTERISTICS

Mainly our drone is useful for high and low level disaster .user should have at least basic Knowledge of using a smart phone (Android based mobiles) so that user will be able to use the app which we have designed for our project. Engineers and technicians can also use our product for testing purposes. Users can use our product for emergency purpose for example flood etc…

VI . OPERATING ENVIRONMENT

The Software operates on Arduino mega board. Arduino board a microcontroller on 16 MHz with no dedicated operating system, which runs on standalone software doesn't require any additional application support.

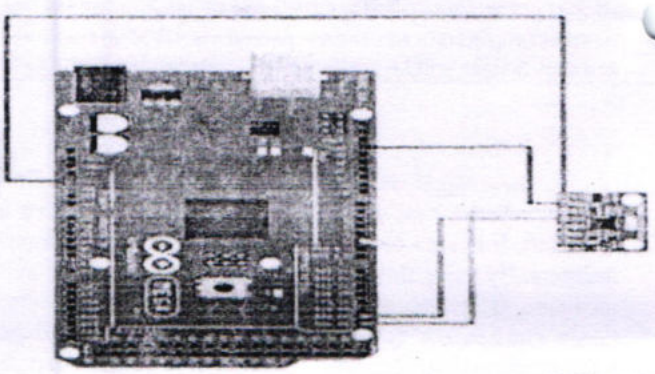

Fig 2. Arduino Interfaced with Gyro 6050

VII. USER INTERFACE

The logical interface in the software product is Android standard UI .We have included the GUI standards ,screen layout constraints, leaver is used for altitude, moving front, back left and right and functions like help. And also used for to start the START drone and LAND to stop the drone.

A. Hardware Interfaces

MPU6050 Gyro+Acc is connected with Arduino using the I2C interface, HMC5883L Compass is interfaced using multiplexed I2C Bus, the ESC's are controlled by connecting it to analog ports. The software supported devices are the android mobiles, nature of the data is strings and text messages, the communication protocols are TCP/IP. The GPS 6050 is also interfaced with the Arduino board to find locations.

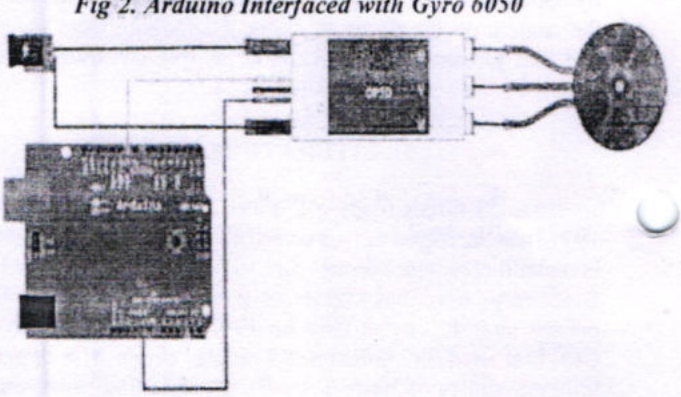

Fig 3. Arduino Interfaced with ESC

B. Software Interfaces

Using the android studio we have interfaced the software components. Library functions used are android's NDK (native development kit), SDK (software development kit).The data going out are the altitudes, movements,

rotations. Nature of communication is through direct peer to peer. The HTTP Server is hosted through APACHE Server.

C. Communications Interfaces

Network server communication service is peer to peer. Message formatting is strings, plain text. Communication standard HTTP. Communication security is WPA2 PSK. Data transfer rate 100mbps

VIII. SYSTEM FEATURES

Our drone live stream the area which is highly affected and find the location by GPS then it carries the need stuff to the people provide it ontime. It is highly efficient and of low cost. It is reliable for any type of weather conditions . The mode of operation of out drone makes it easy to handle. It is controlled with the android based mobile app which is interfaced to the ARDUINO board, GPS, ACCELEROMETER, WIFI MODULE, GYRO and DIGITALCOMPASS. The downward airflow generated is the propellers lifts the drone, moves forward .

IX. COMPONENTS DESCRIPTION

A. ADRUINO MEGA 2560: It is a micro controller which has 54 digital I/p O/p pins out of which 14 pins can be used as PWM pins. It allows inserting a new code, software running on the system.

B. ACCELEROMETER ADXL335: The three axis accelerometer IC used to read X, Y, Z acceleration as the voltages. It will measure the amount of acceleration due to gravity and with the help of it we can find out the tilting angle.

C. WIFI MODULE ESP 8266: The WIFI module uses the software serial port and the hardware serial port for uploading and debugging. The ESP 8266 is a transceiver module. It is of small size and low cost and will work on 3.3V and consumes current Upto250mA.It is not usually powered on battery it should be powered with 3.3V not with 5V so we use the level conversion to communicate with Arduino.

D. *LI-PO BATTERY:* Lithium batteries are the preferred power resources for most electric modelers today. They offer high discharge rates and a high energy storage/weight ratio. However, using them properly and charging them correctly is no trivial task.

E. GPS MODEL 6050: The MPU 6050 sensor contains accelerometer and MEMS gyro in a single chip. It has 16-bits analog to digital and has a sensor 12c-buss to get interface with Arduino. It contains both accelerometer and gyro.

F. HMC5883L 3 AXIS MAGNETOMETER: It is a three axis digital compass magnetometer which gives the direction of the drone it is interfaced using I2C with Arduino.

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X. CONCLUSION

The scope of the project is the best option for helping people during floods. Set waypoints to deliver the load and the drone traverses it and does the required job, or manually control the drone. Wireless camera for easy monitoring .Better way to reach people to help ontime .Here the user can control the drone using an android app and he can connect to the app using Wi-Fi module which is interfaced in the drone. It will precisely route the land area of that particular people, land using GPS no matter shape of the field and the job done. Here we have used the Arduino board which is the open source electronics prototype platform which is interfaced with the Wi-Fi module and GPS. To balance the directions and orientations we have used the ACCELEROMETER, GYRO (MPU 6050), MAGNETOMETER (HMC 5883L). We have a wireless camera that can transmit and receive pictures with high resolution.

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The IEEE 802.11.n in most implementations provides up to 150Mbit/s (in theory the standard can go to 600Mbit/s) although in practice you receive considerably less than this. Note that one out of three of these is an optical technology.

A. How Li Fi it is Different?

Li-Fi technology is based on LEDs for the transfer of data. The transfer of the data can be with the help of all kinds of light, no matter the part of the spectrum that they belong. That is, the light can belong to the invisible, ultraviolet or the visible part of the spectrum. Also, the speed of the internet is incredibly high and you can download movies, games, music etc in just a few minutes with the help of this technology. Also, the technology removes limitations that have been put on the user by the Wi-Fi. You no need to be in a region that is Wi-Fi enabled to have access to the internet. You can simply stand under any form of light and surf the internet as the connection is made in case of any light presence. There cannot be anything better than this technology.

IV. Application of [4]Li-Fi

A. Airlines

Airline Wi-Fi. Ugh. Nothing says captive audience like having to pay for the "service" of dial-up speed Wi-Fi on the plane. And don't get me started on the pricing. The best I've heard so far is that passengers will "soon" be offered a "high-speed like" connection on some airlines. United is planning on speeds as high as **9.8 Mbps** per plane. Uh, I have twice that capacity in my living room. And at the same price as checking a bag, I expect it. Li-Fi could easily introduce that sort of speed to each seat's reading light. Its better than listening to you tell me about your wildly successful son, ma'am.

B. Smarter Power Plants

Wi-Fi and many other radiation types are bad for sensitive areas. Like those surrounding power plants. But power plants need fast, inter-connected data systems to monitor things like demand, grid integrity and (in nuclear plants) core temperature. The savings from proper monitoring at a single power plant can add up to hundreds of thousands of dollars. Li-Fi could offer safe, abundant connectivity for all areas of these sensitive locations. Not only would this save money related to currently implemented solutions, but the draw on a power plant's own reserves could be lessened if they haven't yet converted to LED lighting

C. Undersea Awesomeness

Underwater ROVs, those favourite toys of treasure seekers and James Cameron, operate from large cables that supply their power and allow them to receive signals from their pilots above. ROVs work great, except when the tether isn't long enough to explore an area, or when it gets stuck on something. If their wires were cut and replaced with light — say from a submerged, high-powered lamp — then they would be much freer to explore. They could also use their headlamps to communicate with each other, processing data autonomously and referring findings periodically back to the surface, all the while obtaining their next batch of orders.

D. It Could Keep You Informed and Save Lives

Say there's an earthquake in New York. Or a hurricane. Take your pick — it's a wacky city. The average New Yorker may not know what the protocols are for those kinds of disasters. Until they pass under a street light, that is. Remember, with Li-Fi, if there's light, you're online. Subway stations and tunnels, common dead zones for most emergency communications, pose no obstruction. Plus, in times less stressing cities could opt to provide cheap high-speed Web access to every street corner.

V. Uses in Various Areas

Can be used in the places where it is difficult to lay the optical fiber like hospitals. In operation theatre LiFi can be used for modern medical instruments. In traffic signals LiFi can be used which will communicate with the LED lights of the cars and accident numbers can be decreased. Thousand and millions of street lamps can be transferred to LiFi lamps to transfer data. In aircraft LiFi can be used for data transmission. It can be used in petroleum or chemical plants where other transmission or frequencies could be hazardous.

VI. Conclusion

The possibilities are numerous and can be explored further. If his technology can be put into practical use, every bulb can be used something like a Wi-Fi hotspot to transmit wireless data and we will proceed toward the cleaner, greener, safer and brighter future. The concept of Li-Fi is currently attracting a great deal of interest, not least because it may offer a genuine and very efficient alternative to radio-based wireless. As a growing number of people and their many devices access wireless internet, the airwaves are becoming increasingly clogged, making it more and more difficult to get a reliable, high-speed signal. This may solve issues such as the shortage of radio-frequency bandwidth and also allow internet where traditional radio based wireless isn't allowed such as aircraft or hospitals. One of the shortcomings however is that it only work in direct line of sight.

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Rising Data Availability in Cloud Using Graining Concept

Shivamma, R. Ramya, K. Chaithra and B. Raghavendra Rao

Abstract--- *Cloud computing is a technology with the intention of uses the internet and essential remote servers to maintain data and applications. Cloud computing allows clients and businesses to use applications without installation and admission their individual documentation at any computer with internet access. This equipment allows for much more efficient computing by centralizing storage, memory, processing and bandwidth. Cloud computing provides computation, software applications, data access, data administration and cargo space resources lacking requiring cloud users to know the position and added details of the computing transportation In cloud data are stored in cloud attendant in continuous format. When further number of users try to access same file then traffic will come about in cloud. To solve this trouble we planned mounting Data accessibility in Cloud using Seeding Concept (IDACC) model in cloud computing which helps to reduce interchange in cloud and cost of the cargo space data.*

Keywords--- *Cloud Computing, Data Availability, Security, Storage, Cost-Effective, Cloud Service Provider.*

I. INTRODUCTION

THE end of this decade is obvious by a paradigm shift of the industrial in sequence technology towards a payment based or pay-per-use service business reproduction known as cloud computing. This model provides users with a long list of advantages, such as terms computing capabilities; expansive various network accesses; resource pooling and rapid elasticity with measured services. Huge amount of data being retrieved from geographically scattered data sources, and non-contained data - behavior supplies, creates such a change in technical in addition to business model. One of the famous services offered in cloud computing is the cloud data storage space, have to pay the service providers for this storage service.

This service does not only provides elasticity and scalability for the data storage, it also make available regulars with the benefit of paying only for the amount of data they need to store for a exacting period of time, without any concerns for efficient storage mechanisms and maintainability with big amounts of data storage.

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DOI:10.9756/BIJSESC.8282

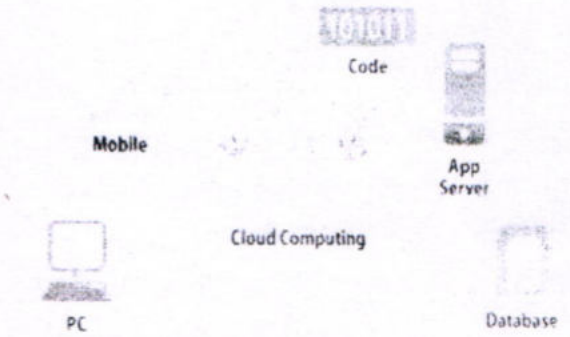

Figure 1: Cloud Computing

Among several SPs existing in the market, based on his existing financial plan. Also we provide a In adding to these benefits, customer's container easily contact their data from any geographical section where the Cloud Service Provider's network or Internet can be accessed. Along with these ented unpreced compensation, cloud data storage as well redefines the safety measures issues under attack on customer's outsourced data (data that is not stored / retrieved from the costumers own servers).Since cloud service providers (SP) are divide marketplace entities, data honesty and seclusion are the most serious issues that require to be addressed in cloud computing. smooth though the cloud service providers have typical policy and dominant transportation to make sure customer's data space to yourself and make available a better accessibility, the news of space to yourself break and examination outage have been clear in last a small number of years and. Also the political control might become an issue with the accessibility of services.

In this work we experimental that, from a customer's point of view, relying upon a solo SP for his outsourced data is not very gifted. In addition, provided that better time alone in addition to make sure data accessibility, can be achieved by separating the user's data building block into data pieces and distribute them among the accessible SPs in such a way that no less than a entry number of SPs can take part in victorious recovery of the whole data building block. To speak to these issues, hence less than a threshold digit of SPs can take part in winning recovery of the whole data chunk to address these issues in this paper; we planned an economical allocation of data between the existing SPs in the market, to provide clients with data availability as well as safe storage. In our model, the client divides his data decision for the client to which SPs he must chose to contact data, with value to data access feature of 5.

II. Related Work

Privacy safeguard and data openness are two of the most critical safety issues connected to user data. inside conservative model the organizations had the physical control of their data and hence have a case of implement improved data security policies. But in case of cloud computing, the data is stored on an self-regulating business gather that provides data storage as a payment service. The users have to trust the cloud service dealer (SP) with safety of their data. In, the writer discussed the criticality of the privacy issues in cloud computing, and sharp out that obtaining in order from a third party is much easier than from the creator himself. Following the pattern of model shift, the security policies also evolved from the conventional cryptographic schemes practical in central and discrete data storage, for enable the data privacy. Many of the cryptographic approaches have been designed for hiding the data from the storage space donor and preserving data privacy. In this authors outlook a scheme in which, the user's independence is also separate from the data, and claim to provide public auditing of data.

These approaches contemplate on one single cloud service provider that can easily become a blockage for such services. In , the authors studied and proved that sole cryptographic events are insufficient for ensuring data privacy in cloud computing. They also argued that the security in cloud storage needs a hybrid model of privacy enforcement, distributed computing and complex trust ecosystems. One bigger concern that arises in such method of cloud storage services is that, there is no full-proof way to be sure that the overhaul provider does not retain the user data, even after the user opts out of the payment. With huge amount of time, such data can be decrypted and significant information can be retrieved and user retreat can easily be breached. Since, the user might not be availing the storage services from that service supplier he will have no clue of such a inactive attack .The improved the cryptographic scheme, the more complex will be it is completion and hence the service provider will Data pieces connecting more than one service providers, in such a way that no one of the SPs can improve various important information from the pieces of data stored on its servers, without getting different more pieces of data from other service providers. Therefore, the directly single service provider based cryptographic techniques does not look too much talented .In, the authors discuss distributing the data over multiple clouds or network in such a way that if an participant is able to interrupt in one network, silent he cannot retrieve any important data since its equivalent pieces are stored in the other network.

Our advance is like to this move near, because both aim to remove the centralized separation of cloud data even though, in their approach, if the competitor causes a service outage even in one of the data networks, the user data cannot be retrieve at all. This is why in our model, we propose to use a needless allotment scheme, such as in, in which at least a threshold number of pieces of the data are necessary out of the whole distribution range, for successful retrieval.

III. Models

First in this segment, we will describe our system model and the danger model. Then, properly we will explain our problem speech we are going to study in this paper. Note that, in this work the terms cloud service source and service provider are interchangeable, the terms cloud storage and cloud data storage are compatible, also the terms user and client are interchangeable.

A. System Overview

We consider the storage services for cloud data storage among two entities, cloud users (U) and cloud check providers (SP). The cloud storage service is normally priced on two factors, how much data is to be stored on the cloud servers and for how long the data is to be stored. In our model, we assume that all the data is to be stored for same period of time. We consider p number of cloud service providers (SP), each available cloud service provider is associated with a QoS factor, along with its cost of providing storage service per unit of stored data (C). Every SP has a different level of quality of service (QoS) offered as well as a different cost associated with it. Hence, the cloud user can store his data on more than one SPs according to the necessary level of security and their reasonable budgets.

B. Warning Model

Customers' stored data at cloud check provider is weak to various pressures. Previous studies in, discuss in detail that a cloud service provider can be a victim to rejection of service attacks or its variants. 626 In our work, we consider two types of warning model. First is the single point of failure, which will affect the data accessibility that could occur if a server at the cloud check source failed if not stopped, which makes it harder for the costumer to pull through his stored data from the server. Accessibility of data is also an significant issue which could be precious, if the cloud check provider (SP) runs out of business. Such worries are no more imaginary issues, consequently, a cloud service shopper can not fully rely upon a alone cloud service provider to make certain the cargo space of his essential data.

To show this risk we use an case in Fig. 2. Let us suppose that three patrons (C1, C2 and C3) store their data on three dissimilar check parts (D1 and D2) and share out these parts on the two data into two presented CSPs (CSP1 and CSP2) in that order. The two cloud check provider is accessible for consumer (C1), who wants to store his own data strongly. In here he will separate his and restore the parts of data that the patron has store on their server and recreate the whole data not including being detected by the user on their server and rebuild the whole data without being detected by the user. Cloud service provider might plan with each other, providers (CSP1, CSP2 and CSP3) respectively. Each customer can get back his own data from the cloud service provider who it has a agreement with. If a breakdown occur at CSP1, due to inner difficulty with the head waiter or some issues with the cloud service contributor, all C1's data

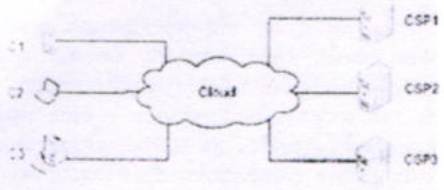

Figure 2: CSP Failure

Data accessibility in Cloud using Seeding impression (IDACC) which was stored on CSP1's servers will be lost and cannot be retrieved .One solution for this danger is that, the user will seek near store his data at several service providers to ensure better accessibility of his data. Our second threat discuss in this paper is the colluding service providers, in which the cloud service providers might collude mutually to reconstruct and admission the user stored data.

In this authors supply the idea for distributing the data among two storage space clouds such that, an challenger cannot get back the inside of the data without having access to both the storage break clouds.

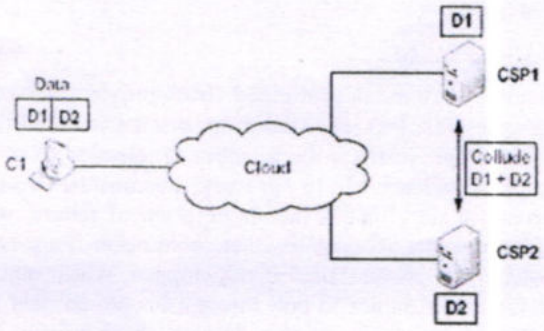

Figure 3:Colluding Cloud Service Providers

Relying totally in the lead a couple of services providers for the storage and loss of data might not be protected next to collude check providers. Such an bother situation is totally passive, since the cloud user cannot distinguish that his in order has been jointly retrieved from the check providers without his authority. We show the colluding check providers' threat in Fig. 3.

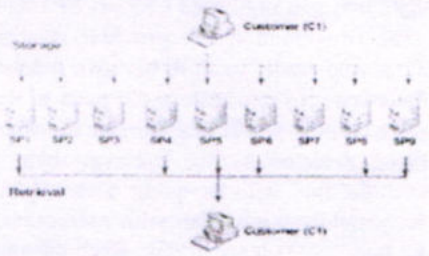

Figure 4: Data storage and Retrieval

C. *Problem Declaration*

In this part, we will properly state the explanation of our trouble that we are going to learn. Given p number of cloud units (Ci). Our Increasing seeks a allocation of customer's data pieces among the available SPs in such a way that, at least q number of SPs must take part in data recovery, while minimizing the total cost of storing the data on SPs as well as maximizing the quality of service provided by the SPs.

IV. Growing Data Accessibility in Cloud Using Seeding Concept

In this work, to lessen the fear in front of cloud storage, we complete the cloud data storage to include compound service providers, where each cloud storage represent a dissimilar service provider. Our inspiration at the rear such an additional room is that, the adversary, similar to any other cloud user, is alert from the definite clouds of servers implemented by dissimilar cloud service supplier.

V. Conclusion

In this paper, we planned a growing Data accessibility in Cloud using Seeding Concept(IDACC)in cloud compute, which seeks to present each customer with a improved cloud data storage decision, taking into compassion the user plan as well as provide him with the best feature of check (Security and availability of data)accessible by accessible cloud service providers. By dividing among distributing customer's data, our model has shown its ability of providing a customer with available storage under his affordable plan

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Relief Algorithm to Avoid Black Hole Assault in AODV Routing for MANET Using Real Time Monitoring

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Abstract: -- **AdhocOn Demand Vector (AODV) is a request driven routing convention in Mobile Ad hoc Network (MANET).There is dependably an asset constraint in adhoc system and danger from malevolent hubs and subsequently achievable arrangement is ideally required. Hence, in this paper, we propose another technique RTM-AODV(Real Time Monitoring AODV). It doesn't introduce any overhead. Also neighbor hub identifies and counteracts Black hole assault using ongoing monitoring. The new proposed strategy is powerful for different sessions. The idea of broadcasting is being utilized as a part of the method.Node which answers to Route Request (R-REQ) by source is being observed in wanton mode.Detection of vindictive hub is really done by neighbor hub of Route Reply (R-REP) sender node.In recreation, new technique has demonstrated outstanding result as far as parcel conveyance proportion as contrast with AODV routing convention in nearness of noxious hub under Black hole assault.**

Keywords:-- **AODV, Black opening, MANET, R-REP message, R-REQ message.**

I. INTRODUCTION

Adhoc On Demand Vector (AODV) is a request driven steering convention in Mobile Ad hoc Network (MANET).There is dependably an asset requirement in adhoc system and there is dependably a danger for versatile adhoc organizes as contrast with customary wired systems since radio waves are the medium of correspondence, and packets are effectively caught. Henceforth there is dependably a high hazard for a security risk in remote adhoc systems .Maintaining security is a pivotal assignment in such systems. There are various assaults which unfavorably influence the system. A portion of the assaults are Black hole, worm gap etc. Subsequently it is essential to create proficient convention that moderates these sorts of assaults. There are various adjustment of AODVconvention, for example, EAODV [3]OAODV [5] and IAODV [7] proposed by analysts to moderate against Black hole assault. These conventions are subjected to environment limitations and experience the ill effects of various drawbacks:

Wastage [1] of memory space and a lot of preparing time.Over utilization [2] of restricted data transmission what's more of keeping up additional database for declarations. Enhance AODV is subjected to single session use imperative.IDSAODV[4] experiences single session use. High control packet overhead and system overhead in light of broadcasting OREQ control Packets. Network overhead alongside [6] support of additional space for mentioning objective fact table. There is an issue of vast space stockpiling for putting away id of vindictive hub in IAODV. To defeat a portion of the issues, there is a need to build up a convention that is more proficient as far as packet delivery division as contrast with AODV under Black hole assault. Paper means to build up an effective convention to alleviate dark gap assault.

II. RECOGNITION ALGORITHM AGAINST BLACK HOLE ASSAULT

Malevolent hub is being recognized by utilizing Real time checking and broadcasting system. Also wanton mode is utilized for location of pernicious node.The following of exercises performed by immediateneighbor hubs which are in transmission scope

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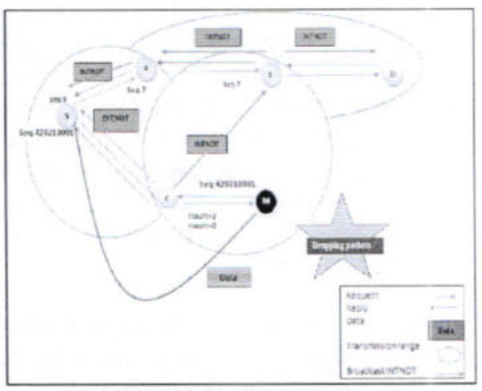

Fig.2. Relief of Malicious node

B. *Relief algorithm*

Step1: Check whether id of malicious node is present in blacklist or not.
Step2: If Malicious Id Is Present In Blacklist
Step3: Then Discard The Reply Packet From The Malicious Node
Step4: Else If It Comes From Intermediate Node
Step5: Forward Data Packet
Step6: Else Send Out Data Packet In Buffer

On the distinguishing proof of blackhole hub, Neighbor Node takes an activity to advise all hubs by communicating a packet called INTNOT in the system. This packet contains fields like Packet sort, malicious indicator id, Malicious id, Destination id, Lifetime and Time Stamp. Packet sort is utilized to recognize this packet from information and control packets. Malignant indicator id is utilized for Neighbor Node identifying malevolent hub. Also boycott design contains id of vindictive hub, id of interloper identifier and time stamp of packet.

IV. RESULT

A. *Packet delivery proportion*

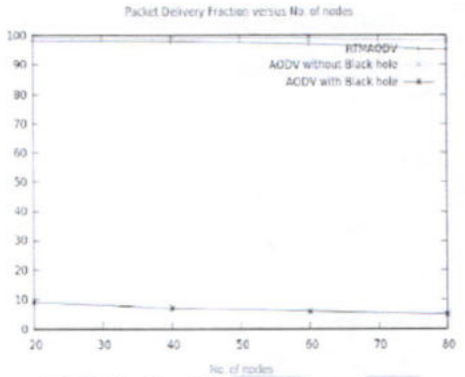

Fig2. Packet delivery proportion

Fig2. Demonstrates[8] the chart between packet delivery proportion and number of hubs. On changing number of hubs, packet delivery proportion somewhat gets diminish. It is exceptionally all around delineated that within the sight of vindictive hub, packet delivery proportion gets diminish tomuch stretch out in AODV steering convention. Our calculation mitigates the Black hole assault and gives better result as far as packet delivery proportion.

B. *End to End defer*

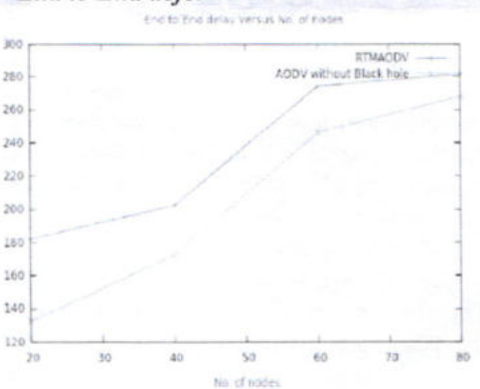

Fig3. End to End defer

Fig3. Demonstrates [8] the diagram between end to end defer and number of hubs. On fluctuating number of hubs, end-to-end gets increment. It is being represented in the assume that there is slight increment in deferral in our calculation as contrast with AODV steering convention. The reason being, some measure of time is being required for recognition and relief of pernicious hub.

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Public Water Supply Grid Monitoring To Avoid Tampering & Water Man Fraud using IOT

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Abstract— **In urban areas the water supply to residence and commercial establishments are provided at a fixed flow rate. There are incidents of excess water drawn by certain customers/users i.e., water will be released unofficially which is considered as water theft. In this project it is proposed to develop an embedded based remote water monitoring and theft prevention system by taking the data of water supply at the consumer/user end. The overall objective of a distribution system is to deliver wholesome water to the consumer at particular area and in sufficient quantity and achieve continuity and maximum coverage at affordable cost. To attain this objective the organization has to evolve operating procedures to ensure that the system can be operated satisfactorily, function efficiently and continuously as far as possible at lowest cost.**

Keywords: **LCD, Microcontroller, Logic Level Converter.**

I. INTRODUCTION

With the continuous economic growth the water demand of enterprises is also increasing .The monitoring of water resource for these enterprises can prevent the occurrence of stealing water and leakage water effectively. In existing system urban water is supplied to home with man power which takes more time. Therefore the monitoring system of urban water supply has aroused extensive attention in recent years

II. EXISTING SYSTEM

In existing system, urban water is supplied to the home with the help of some man power. The person in charge will go to the place and then open the valve to that particular area. Once the time is over the person will go again to that place and close the valve. This type of operation needs man power. People may take excess water for their personal use with the help of motor or some other equipment. Due to this many people will not receive sufficient water for their use. The theft can be prevented only when any public inform the officials about the theft. But the possibility of public is informing to higher officers are rare. So the theft prevention or one who does the theft is difficult to identify in the early methods.

III.PROPOSED SYSTEM

The overall objective of a distribution system is to deliver wholesome water to the consumer at particular area and in sufficient quantity and achieve continuity and maximum coverage at affordable cost. Here we are using AT89S52 as our controller and also few sensors are arranged to detect the presence of water in that particular pipeline. As logic level converters are used to detect the water flow. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. All the details will be shown in the web server using IoT module connected to the controller

IV. METHODOLOGY

Here we are using AT89S52 as our controller and also few sensors are arranged to detect the presence of water in that particular pipeline. As logic level converters are used to detect the water flow .Water should be released as per the instructions by officials i.e., for example alternate days of supply is provided and only during specific period of time but not daily.All the details will be shown in the web server using IoT module connected to the controller. So that the authorities can take necessary action in case of misuse. This is an advanced, trouble-free, fit and forget system for water board. By using all these malfunctioning can be avoided. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Fig 1 Block Diagram

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Peristaltic Flow of a Conducting Newtonian Fluid in an Inclined Channel under the Effects of Hall Current

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Abstract:- In this paper, the effect of hall on the peristaltic flow of a conducting fluid in an inclined two dimensional channel under the assumption of long wavelength is investigated. A closed form solution is obtained for axial velocity and pressure gradient. The effect of various emerging parameters on the time-averaged volume flow is analyzed with the help of graphs.

Keywords: **Newtoninan fluid, Hall, Hartmann number, peristaltic flow, Froude number**

I. INTRODUCTION

The word peristalsis stems from the Greek word Peristaltikos, which means clasping and compressing. Peristaltic pumping is a form of fluid transport generated in the fluid contained in a distensible tube when a progressive wave travels along the wall of the tube. It is an inherent property of many syncytial smooth muscle tubes; stimulation at any point can cause a contractile ring to appear in the circular muscle of the gut, and this ring then spreads along the tube. In such a way, peristalsis occurs in the gastrointestinal tract, the bile ducts, other glandular ducts throughout the body, the ureters, and many other smooth muscle tubes of the body, Guyton and Hall (2003). The study of the mechanism of peristalsis in both mechanical and physiological situations has recently become the object of scientific research. since the first investigation of Latham (1966). Several theoretical and experimental attempts have been made to understand peristaltic action in different situations. A review of much of the early literature is presented in an article by Jaffrin and Shapiro (1971). A summary of most of the experimental and theoretical investigations reported with details of the geometry, fluid Reynolds number, wavelength parameter wave amplitude parameter and wave shape has been given by Srivastava and Srivastava (1984).

The magnetohydrodynamic (MHD) flow of a fluid in a channel with peristalsis is of interest in connection with certain flow problems of the movement of conductive physiological fluids, (e.g., the blood flow in arteries). Agrawal and Anwaruddin (1984) investigated the effect of magnetic field on the peristaltic flow of blood using long wavelength approximation method and observed for the flow of blood in arteries with arterial stenosis or arteriosclerosis, that the influence of magnetic field may be utilized as blood pump in carrying out cardiac operations. Mekheimer (2004) studied the peristaltic transport of blood under effect of a magnetic field in non uniform channels. Hayat et al. (2007) have first investigated the Hall effects on the peristaltic flow of a Maxwell fluid trough a porous medium in channel. Hall Effect on peristaltic flow of third order fluid in a porous medium with heat and mass transfer was studied by Eldabe (2015). Recently, Subba Narasimhudu and Subba Reddy (2017) have investigated the effects of Hall on the peristaltic flow of a hyperbolic tangent fluid in a channel.

In view of these, the effect of hall on the peristaltic flow of a conducting fluid in an inclined two dimensional channel under the assumption of long wavelength is investigated. A closed form solution is obtained for axial velocity and pressure gradient. The effect of various emerging parameters on the time-averaged volume flow is analyzed with the help of graphs.

II. MATHEMATICAL FORMULATION

We consider the peristaltic pumping of a conducting Newtonian fluid flow in an inclined channel of half-width a. A longitudinal train of progressive sinusoidal waves takes place on the upper and lower walls of the channel. For

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simplicity, we restrict our discussion to the half-width of the channel as shown in the Fig.1. The wall deformation is given by

$$H(X,t) = a + b\sin\left[\frac{2\pi}{\lambda}(X - ct)\right] \tag{2.1}$$

where b is the amplitude, λ the wavelength and c is the wave speed.

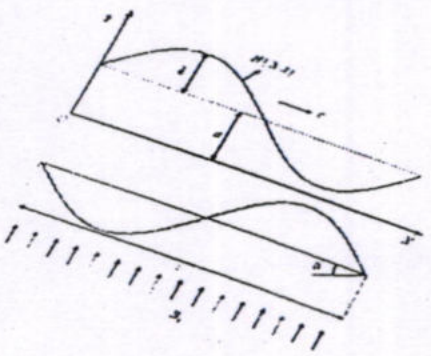

Fig. 1 Physical Model

Under the assumptions that the channel length is an integral multiple of the wavelength λ and the pressure difference across the ends of the channel is a constant, the flow becomes steady in the wave frame (x, y) moving with velocity c away from the fixed (laboratory) frame (X, Y). The transformation between these two frames is given by

$$x = X - c\,t,\ y = Y,\ u = U - c,\ v = V \quad \text{and} \quad p(x) = P(X, t), \tag{2.2}$$

where (u, v) and (U, V) are the velocity components, p and P are pressures in the wave and fixed frames of reference, respectively.

The equations governing the flow in wave frame are given by

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0, \tag{2.23}$$

$$\rho\left(u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y}\right) = -\frac{\partial p}{\partial x} + \mu\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right) + \frac{\sigma B_0^2}{1+m^2}\left(mv - (u+c)\right) + \rho g\sin\alpha \tag{2.4}$$

$$\rho\left(u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y}\right) = -\frac{\partial p}{\partial y} + \mu\left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right) - \frac{\sigma B_0^2}{1+m^2}\left(m(u+c) + v\right) - \rho g\cos\alpha \tag{2.5}$$

where ρ is the density σ is the electrical conductivity, B_0 is the magnetic field strength and m is the Hall parameter.

The dimensional boundary conditions are

$$u = -c \quad \text{at} \quad y = H \tag{2.6}$$

$$\frac{\partial u}{\partial y} = 0 \quad \text{at} \quad y = 0 \tag{2.7}$$

Introducing the non-dimensional quantities

$$\bar{x} = \frac{x}{\lambda}, \bar{y} = \frac{y}{a}, \bar{u} = \frac{u}{c}, \bar{v} = \frac{v}{c\delta}, \delta = \frac{a}{\lambda}, \bar{p} = \frac{pa^2}{\mu c\lambda}, \bar{t} = \frac{ct}{\lambda}, h = \frac{H}{a}, \phi = \frac{b}{a}, \bar{q} = \frac{q}{ac}, M^2 = \frac{\sigma a^2 B_0^2}{\mu}$$

Into equations (2.3) to (2.5), we get

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \tag{2.8}$$

$$\mathrm{Re}\,\delta\left(u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y}\right) = -\frac{\partial p}{\partial x} + \left(\delta^2\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right) + \frac{M^2}{1+m^2}\left(m\delta v - (u+1)\right) + \frac{\mathrm{Re}}{Fr}\sin\alpha \tag{2.9}$$

$$\mathrm{Re}\,\delta^2\left(u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y}\right) = -\frac{\partial p}{\partial y} + \delta^2\left(\delta^2\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right) - \frac{\delta M^2}{1+m^2}\left(m(u+1) + \delta v\right) + \frac{\delta\,\mathrm{Re}}{Fr}\cos\alpha \tag{2.10}$$

where $Fr = \frac{c^2}{ag}$ is the Froude number, M is the Hartmann number and Re is the Reynolds number.

Using long wavelength (i.e., $\delta << 1$) approximation, the equations (2.9) and (2.10) become

$$\frac{\partial^2 u}{\partial y^2} - \frac{M^2}{1+m^2}u = \frac{\partial p}{\partial x} - \frac{\mathrm{Re}}{Fr}\sin\alpha + \frac{M^2}{1+m^2} \tag{2.11}$$

$$\frac{\partial p}{\partial y} = 0 \tag{2.12}$$

From Eq. (2.12), it is clear that p is independent of y. Therefore Eq. (2.11) can be rewritten as

$$\frac{\partial^2 u}{\partial y^2} - \frac{M^2}{1+m^2}u = \frac{dp}{dx} - \frac{\mathrm{Re}}{Fr}\sin\alpha + \frac{M^2}{1+m^2} \tag{2.13}$$

The corresponding non-dimensional boundary conditions are given as

$$u = -1 \quad \text{at} \quad y = h \tag{2.14}$$

$$\frac{\partial u}{\partial y} = 0 \quad \text{at} \quad y = 0 \tag{2.15}$$

Knowing the velocity, the volume flow rate q in a wave frame of reference is given by

$$q = \int_0^h u\,dy. \tag{2.16}$$

The instantaneous flow $Q(X,t)$ in the laboratory frame is

$$Q(X,t) = \int_0^h U\,dY = \int_0^h (u+1)\,dy = q + h \tag{2.17}$$

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The time averaged volume flow rate $\overline{Q}$ over one period $T\left(=\frac{\lambda}{c}\right)$ of the peristaltic wave is given by

$$\overline{Q}=\frac{1}{T}\int_0^T Q dt = q+1 \qquad (2.18)$$

III. SOLUTION

Solving Eq. (2.13) together with the boundary conditions (2.14) and (2.15), we get

$$u=\frac{1}{\beta^2}\left(\frac{dp}{dx}-\frac{\mathrm{Re}}{Fr}\sin\alpha\right)\left[\frac{\cosh\beta y}{\cosh\beta h}-1\right]-1 \qquad (3.1)$$

Where $\beta = M/\sqrt{1+m^2}$.

The volume flow rate q in a wave frame of reference is given by

$$q=\frac{1}{\beta^3}\left(\frac{dp}{dx}-\frac{\mathrm{Re}}{Fr}\sin\alpha\right)\left[\frac{\sinh\beta h-\beta h\cosh\beta h}{\cosh\beta h}\right]-h \qquad (3.2)$$

From Eq. (3.2), we write

$$\frac{dp}{dx}=\frac{(q+h)\beta^3\cosh\beta h}{\sinh\beta h-\alpha h\cosh\beta h}+\frac{\mathrm{Re}}{Fr}\sin\alpha \qquad (3.3)$$

The dimensionless pressure rise per one wavelength in the wave frame is defined as

$$\Delta p=\int_0^1\frac{dp}{dx}dx \qquad (3.4)$$

Note that, as $\alpha\to 0$, $M\to 0$ and $m\to 0$ our results coincide with the results of Shapiro et al. (1969).

IV. RESULTS AND DISCUSSION

The variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of Hartmann number M with $\phi=0.5$, $\mathrm{Re}=5$, $Fr=2$, $\alpha=\frac{\pi}{4}$ and $m=0.2$ is depicted in Fig. 2. It is found that, the time-averaged flow rate $\overline{Q}$ increases in the pumping region $(\Delta p>0)$ with increasing M, while it decreases in both the free-pumping $(\Delta p=0)$ and co-pumping $(\Delta p<0)$ regions with increasing M.

Fig. 3 illustrates The variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of Hall parameter m with $\phi=0.5$, $\mathrm{Re}=5$, $Fr=2$, $\alpha=\frac{\pi}{4}$ and $M=1$. It is observed that, the time-averaged flow rate $\overline{Q}$ decreases in the pumping region with an increase in m, while it increases in both the free-pumping and co-pumping regions with increasing m.

The variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of Froude number Fr with $\phi=0.5$, $\mathrm{Re}=5$, $\alpha=\frac{\pi}{4}$, $M=1$ and $m=0.2$ is shown in Fig. 4. It is observed that as increase in Fr decreases the time averaged flow rate $\overline{Q}$ in all the pumping, free-pumping and co-pumping regions.

Fig. 5 shows the variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of Reynolds number Re with $\phi=0.5$, $Fr=2$, $\alpha=\frac{\pi}{4}$, $M=1$ and $m=0.2$. It is found that, on increasing Re increases the time averaged flow rate $\overline{Q}$ in all the pumping, free-pumping and co-pumping regions.

The variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of inclination angle α with $\phi=0.5$, $\mathrm{Re}=5$, $Fr=2$, $M=1$ and $m=0.2$ is presented in Fig. 6. It is noticed that, the time averaged flow rate $\overline{Q}$ increases with increasing α in all the pumping, free-pumping and co-pumping regions.

Fig. 6 depicts the variation of pressure rise Δp with time-averaged flow rate $\overline{Q}$ for different values of amplitude ratio ϕ with $m=0.2$, $\mathrm{Re}=5$, $Fr=2$, $\alpha=\frac{\pi}{4}$ and $M=1$. It is observed that, the time-averaged flow rate $\overline{Q}$ increases with increasing amplitude ratio ϕ in both the pumping and free pumping regions, while it decreases with increasing amplitude ratio ϕ in the co-pumping region for chosen $\Delta p(<0)$.

V. CONCLUSIONS

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Mobile Applications In Context of Big Data A Survey

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Abstract— A large scale research initiative aimed at generating innovations around handheld devices based research as well as community based evaluation of related mobile applications. Big data refers to huge amount of digital information collected from multiple and different sources. Since a key point of big data is to access data from multiple and different domains, security will play a very important role in big data research and technology. Due to increase the challenges in mobile data or mobile data challenge (MDC), Big data is required for analysis and curation of mobile data. The rapid expansion of mobile technology has introduced a versatile global infrastructure that internally generate vast amount of data like user identification, location, device name and externally generate data related to mobile apps like number of mobile applications, number of downloaded applications, number of failure applications, number of popular applications etc. This paper presents a survey of the mobile applications (apps) in the context of Big data.

***Index Term*: Big Data, Mobile Data Challenges (MDC)**

I. INTRODUCTION

There are large amount of applications for handheld devices are available in the market. Software industries traditionally generated vast amount of mobile applications for the customers. The mobile apps on the other hand executing on powerful computational devices equipped with multitude of sensors that are capable of generating vast amount of data (geolocation, audio, and video) has brought data collection and crowd sourcing to the fingertips of virtually any of millions of mobile app vendors. Big data refers to the huge amount of data organization and government collect about us and our surroundings. Big data "size" is constantly growing because we create everyday millions bytes of data. The use of mobile computing technology is growing day by day rather than use of traditional desktop technology [1].

A large number of applications have been regularly developed. One of the most popular applications is social media apps. Social media apps Social data includes information from customer feedback streams, micro blogging sites like Twitter, and social media platforms like Facebook. Importantly, Facebook recently announced that the number of daily mobile users exceeded daily web users for the first time [2]. This shows that the adoption of mobile technology is continue to increase.

II. MOBILE COMPUTING

Mobile computing means operation performed by mobile devices is HCI (Human Computer Interaction) [3]. In mobile Computing different things involves like mobile communication, mobile hardware, mobile software. The term "mobile computing " is used to describe the use of computing devices which usually interact in some with a central information system--while away from the normal, fixed workplace. Mobile computing technology enables the mobile worker to create, access, process, store and communicate information without being constrained to a single location. By extending the reach of an organization's fixed information system, mobile computing enables interaction with organizational personnel that were previously disconnected. Mobile computing is the discipline for creating an information management platform, which is free from spatial and temporal constraints. The freedom from these constraints allows its users to access and process desired information from anywhere in the space. The state of the user, static or mobile, does not affect the information management capability of the mobile platform being constrained to a single location. To facilitate the data management activities, users can carry Personal Digital Assistant (PDA), laptop, cell phones, etc. At present the current technology only provides limited transaction processing capabilities but soon such facilities will be available on all mobile devices such as cell phones, laptops, palmtops, etc.

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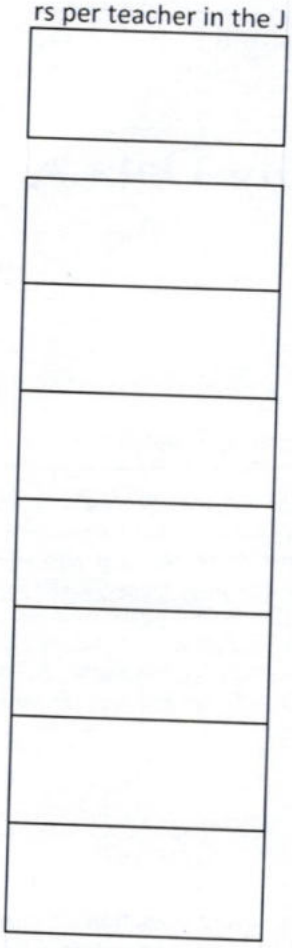

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¾ Finance
¾ Gaming
¾ Entertainment
¾ Technology

A. Types of Smartphone apps used daily

¾ 68% Social and communication
¾ 33% Media or entertainment related
¾ 46% Games or gaming related
¾ 19% Retail stores or retail related

B. Sources of awareness of Smartphone apps

¾ 52% Friends, family, and colleagues
¾ 40% Browse the app store
¾ 27% Search engines
¾ 24% Company website
¾ 22% TV

C. Reasons for downloading an app

¾ 33% Recommended by others
¾ 31% Sounded interesting/fun
¾ 24% Familiarity with brand
¾ 18% Access exclusive documents

V. BIG DATA AND MOBILE ANALYTICS

Big data characterised by the following dimensions:

A. Volume

Dealing with the sheer amount of the data. This applies to the huge voluminous size or volume of the data that cannot be managed via traditional designers.

B. Variety

Size by voluminous data could be in a number of different forms such as structured or un-structured, text, images, videos etc. It can emanate from a number of different sources, contrivances, or channels such as online, offline, convivial media, mobile, sensors, cameras, TV etc.

C. Velocity

This applies to the immensely colossal volume of data that can emanate from a number of different sources at a high speed that cannot be managed via traditional denotes. Big data velocity deals with the pace at which data flows in form sources like business process, machines, network and human interaction with things like social media sites, mobile devices etc.

D. Veracity

By using veracity we can verify to the data, uncertainty, inconsistency and incompleteness of the data. This applies to the state or validity of the data in cognation to the time and also refers to the data in motion such as real-time streaming of data or data at rest like those stored in the database.

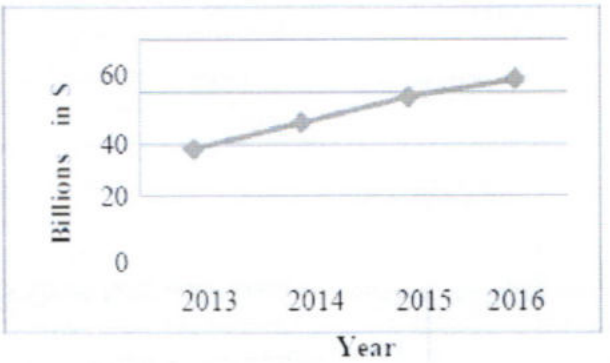

Fig 2: Big Data Market Forecast [8]

2014 was a big year for big data, a term that gradually gained momentum to become one of the most talked-about subjects in the tech world. With 2015 fast approaching, prepare for big data's total domination, as it, along with the Internet of Things, is set to be the focus of web and mobile. It will become standard for businesses to try and benefit from it by analyzing as much as possible. The number of mobile users is expected to increase in the coming years, with a greater dependency on mobile in general. By 2016, 61 percent of web traffic will come from wireless devices as opposed to desktops, contributing heavily to the growth of big data.

VI. CHALLENGES OF MOBILE BIG DATA IN MOBILE COMPUTING

According to IDC the big data market is expected to grow from $3.2 billion in 2010 to $16.9B in 2015. Due to the above characteristics described by volume, variety, velocity, and value, there are new challenges in order to efficiently deliver mobile big data in mobile device.

A. How to Store a Very Large Volume of Mobile app Big Data

e during the last five years (8)

Department of the teacher	Name of journal	Year of publication	ISBN/ISSN
Computer Scie	International journal on inventive systems and control (ICISC)	Jul-05	IEEE-ICISC
Computer Scie	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017	ISSN: 2394-2320
Computer Scie	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017	ISSN: 2394-2320
Computer Scie	International Journal of Engineering research in computer science & engineering(IJERCSE)	2017	ISSN: 2394-2320
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Computer Scie	International journal of Advanced research in Computer science & engineering(IJERCSE)	2017	ISSN: 2394-2320
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Misbehaving Node Detection using Secure Acknowledgement in MANET

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Abstract— **Mobile ad hoc networks (MANETs) can be defined as a collection of large number of mobile nodes. MANET is preferred in variety of applications such as military, disaster stuck areas, emergency recovery etc. MANET is vulnerable to various attacks due to its open medium and wide distribution of nodes. This itself emphasize the importance of security and need for an efficient system, for example intrusion detection system in MANET. The Misbehavior such as, delay or drop in data packets or acknowledgement packets, drop packets and modify routing information etc. are present. These Misbehavior need to be detected well in advance to keep network secure. In this paper we propose and implement, new IDS named as Secure Acknowledgement (ACK) System. The Secure ACK system is purely an acknowledgement based technique. The type of Misbehavior detected by proposed system is about delay in packet transmission. In this system, for every three consecutive nodes in the route, the third node is required to send back an acknowledgement packet to the first node in the group. Based on the non-receipt of ACK packet within predefine time to the first node in the group, it reports about Misbehavior activity in the network. As soon as the proposed system detects misbehaving node present in the network, it stops the further data transmission. So, the misbehaving node will not be able to damage network thereafter.**

Keywords— **MANET; Vulnerability in MANET; Intrusion Detection System; Acknowledgement Based Schemes; Misbehaving Nodes; Secure ACK.**

I. INTRODUCTION

Mobile Ad hoc Network termed as MANET is a collection of mobile nodes. Mobile nodes can be cell phones, PDAs, laptops etc. Every node in MANET has ability to transmit and receive data. Such mobile nodes in MANET can communicate with each other without fixed infrastructure. MANET can create its own self configuring and self maintaining network without centralized infrastructure. Basically there are two types of MANET: Close and Open [1] . In closed MANET, all mobile nodes cooperate with each other for common goal. On the other hand in open MANET different mobile nodes having different goals share resources and hence ensure global connectivity. MANET has two types of networks, one is

Single hop and another is Multi hop. There can be direct or indirect communication within nodes. In single hop network all nodes are within same range and can communicate directly which is known as direct communication. In multi hop network nodes rely on neighbors to communicate beyond transmission range which is known as indirect communication [2]. Communication in the network depends upon the trust on each other and communication works properly if all nodes co-operate with each other for data transmission.

Misbehavior of Nodes

In MANET, "Misbehavior" refers to node that does not behave in proper way. In other words, if behavior of node deviates from its specification or set of behaviors then the node is said to be misbehaving [3],[4]. Misbehavior takes place in different ways, such as, delay data packets or acknowledgement packets, don't forward packet to save own resources, drop data packets or acknowledgement packets, drop packets and modify routing information, forward control packets while dropping data packet types of Misbehavior namely, failed / malfunctioned, selfish and malicious [4].

x Failed / Malfunctioned: A node malfunctions because of hardware and software problems, climate, radio channel, link breakdown, accidental physical damage.

x Selfish: Selfish nodes have passive Misbehavior. Selfish nodes do not intend to directly damage other nodes and do not cooperate. It saves battery life for own communication. A selfish node is unwilling to spend CPU cycles and available network bandwidth to forward packets.

x Malicious: Malicious nodes have active Misbehavior. Malicious node intentionally damages network and interrupt operations. A malicious node may drop the packets, modify the routing information. It may not give priority to battery power saving.PROBLEM STATEMENT

In literature, there are various IDSs proposed to detect misbehaving node in the network, but each system has some limitations. Aim of the proposed IDS is to overcome those limitations and efficiently detect

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misbehaving node present in the network. Type of Misbehavior to be detected using proposed IDS is about Delay in transmission of Data packets or Acknowledgement packets. Proposed system is designed to overcome limitations of Watchdog and TWOACK Technique. Some drawbacks of watchdog system stated above are discussed in detail below.

II . RECEIVER COLLISION

As shown in Fig.1, there are six nodes with 'S' as source node, 'D' as destination node and N1, N2, N3, N4 are intermediate nodes in path. When, Node N1 sends Packet 1 to node N2, it tries to overhear if node N2 forwarded this packet 1 to node N3; meanwhile, node N4 is forwarding Packet 2 to node C. In such case, node N1 overhears that node N2 has successfully forwarded Packet 1 to node N3 but failed to detect that node N3 did not receive this packet due to a collision between Packet 1 and Packet 2 at node N3.

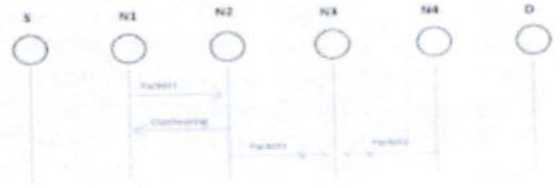

Fig.1 Receiver Collision

III. LIMITED TRANSMISSION POWER

As shown in Fig.2, there are six nodes with 'S' as source, 'D' as destination and N1, N2, N3, N4 as intermediate nodes. Packet 1 is getting transmitted from source node to destination node. During transmission in order to preserve its own battery resources, node N2 intentionally limits its transmission power. So, packet transmission is strong enough to be overheard by node N1 but too weak to be received by node N3.

Fig.2 Limited Transmission Power

As shown in Fig.3, although node N1 successfully overheard that node N2 has forwarded packet 1 to node N3, node N1 still reported node N2 as misbehaving. Due to open medium and remote distribution of MANTEs, attackers can easily captures and compromise one or two nodes to achieve this false Misbehavior report attack.

IV. PROPOSED SYSTEM

A. Proposed Solution

In this paper we propose and implement, new IDS named Secure ACK. The system is proposed to overcome drawbacks of Watchdog and TWOACK stated before. Secure ACK system is purely an acknowledgement based technique. It is based on Enhanced Adaptive Acknowledgement (EAACK) system [12], but includes enhancement in a key technique for detection of misbehaving node present in network. The type of Misbehavior to be detected by proposed system is about packet delay or acknowledgement delay. It detects this malicious activity in the network within very less time and stops data transmission, so the misbehaving node will not be able to damage the network thereafter.

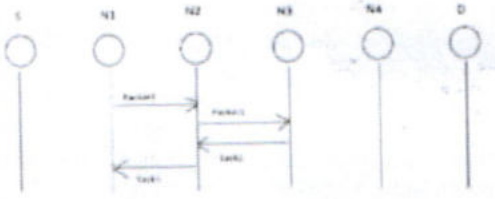

Fig.4 Secure ACK Mechanism

In EAACK system, if node N1 does not receive the SACK acknowledgement packet within a predefined time period, both nodes N2 and N3 were reported as malicious. Moreover, a Misbehavior report for node N2 and N3 will be generated by node N1 and sent to the source node. Using Misbehavior Report Authentication mechanism [12], the report about node N2 and N3 is verified. The verification was in terms of whether packets received at destination or not. If packet is received at destination through nodes N2 and N3, it concludes that report was false and node creating such report is malicious node. But again, it was not capable to detect which node intentionally delays data or acknowledgement packets.

In Secure ACK system, if node N1 does not receive the SACK acknowledgement packet within a predefined time

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period, nodes N2 and N3 are reported as malicious by node N1. In such case our proposed system immediately checks for Per Hop Delay between nodes N1, N2 and N3 i.e. within group of three consecutive nodes. For nodes N1 and N2, if data packet is not received within predefined time period at node N2 then, node N1 is concluded as misbehaving.data packet is not received within predefined time period at node N2 then, node N1 is concluded as misbehaving.
Secure ACK Algorithm

Input: A network topology with n nodes.
Output: Detect misbehaving node in network of n nodes.
Condition: Misbehavior is of type packet delay.

Step 1: Create network of n nodes.

Step 2: Set source node 'S' and destination node 'D'.

Step 3: Use routing protocol to find path between given source and destination. Suppose path is, S -N1 - N2 - N3 - N4 - D.

Step 4: Allow data traffic to flow between source and Destination through specified path.

Step 5: For successive 3 consecutive nodes (for e.g. 'S - N1 - N2' or 'N1- N2 - N3' and so on), as soon as packet reaches third node in each group of 3 nodes, send SACK packet to first node in group through same route in reverse order.

Step 6: Calculate Intermediate Round trip time (IRTT) wherein no malicious node present in the network. Let's consider group of 3 nodes as N1-N2-N3,

IRTT (N1, N2, N3) = TDatapkt (N1, N2) + TDatapkt (N2, N3) +
TSACKpkt (N3, N2) + TSACKpkt (N2, N1) (1)

Where, TDatapkt is time required for Data Packet to travel from one node to another.

Where, TSACKpkt is time required for SACK Packet to travel from one node to another.

Step 7: Set an average Predefined Threshold value for IRTT as RTT. Maximum marginal delay 'ĵ¶ is the delay that can be added in maximum IRTT to set threshold value.

Step 8: Set an average Predefined Threshold value for Per Hop Delay (PHD) between nodes.

PHD = Max (TDatapkt (3)

Step 9: For each packet and for each group of 3 consecutive nodes, compare RTT,

Loop while (not end of simulation)

{

If (IRTT (N1, N2, N3) > RTT)
{
N1 Reports N2 and N3 as malicious.
If (TDatapkt (N1, N2) > PHD)

{
Network is not safe, node N1 is malicious. Terminate data transmission.

}
If (TDatapkt (N2, N3) > PHD)
{
Network is not safe, node N2 is malicious. Terminate data transmission.

}
}
Else
Network Is Safe. }//end while

V. SIMULATIONS AND RESULTS

Our simulation is conducted using the simulator developed by us in netbeans7.0.1 and JAVA – jdk1.0.7.0.45. We have generated network of 9 nodes. Designate source node and destination node, then we have to find path between this source and destination nodes. After obtaining the routing path, randomly any one node except source and destination can be set as malicious node. Malicious node will hold each incoming packet for some seconds with it. We have given the delay for malicious node in-between 3 to 9 seconds.

VI.CONCLUSION AND FURTHER RESEARCH

MANET is vulnerable to various attacks due to its open medium and wide distribution of nodes. In this paper, we implemented Secure ACK system to overcome weaknesses of existing systems. Proposed system works efficiently in

presence of misbehaving node and instantly detects such node. The malicious activity detected in this paper is about malicious delay in packet transmission. System detects Misbehavior of any node in the network using Secure ACK algorithm within less time and stops data transmission. So, the misbehaving nodes would not be able to damage network thereafter.

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Li-Fi (Light Fidelity)-The Future Technology in Wireless Communication

K. Harshitha, A. Chaithra, N.A. Poojitha and B. Raghavendra Rao

Abstract--- *Whether you're using wireless internet in a coffee shop, stealing it from the guy next door, or competing for bandwidth at a conference, you have probably gotten frustrated at the slow speeds you face when more than one device is tapped into the network. As more and more people and their many devices access wireless internet, clogged airwaves are going to make it. One germen phycist. Harald Haas has come up with a solution he calls "data through illumination" –taking the fibber out of fiber optic by sending data through an 1LED light bulb that varies in intensity faster than the human eye can follow. It's the same idea band behind infrared remote controls but far more powerful. Haas says his invention, which he calls DLIGHT, can produce data rates faster than 10 megabits per second, which is speedier than your average broadband connection. He envisions a future where data for laptops, smart phones, and tablets is transmitted through the light in a room. And security would be snap – if you can't see the light, you can't access the data.*

Keywords--- *LED (Light emitted diode), Wi-Fi, VLC.*

I. INTRODUCTION

LIFI is transmission of data through illumination by taking the fiber out of fiber optics by sending data through a [2]LED light bulb that varies in intensity faster than the human eye can follow. Li-Fi is the term some have used to label the fast and cheap wireless-communication system, which is the optical version of Wi-Fi. The term was first used in this context by Harald Haas in his TED Global talk on Visible Light Communication. "At the heart of this technology is a new generation of high brightness light-emitting diodes", says Harald Haas from the University of Edinburgh, UK, "Very simply, if the LED is on, you transmit a digital 1, if it's off you transmit a 0,"Haas says, "They can be switched on and off very quickly, which gives nice opportunities for transmitted data."It is possible to encode data in the light by varying the rate at which the LEDs flicker on and off to give different strings of 1s and 0s.The LED intensity is modulated so rapidly that human eye cannot notice, so the output appears constant. More sophisticated techniques could dramatically increase VLC data rate. Terms at the University of Oxford and the University of Edingburgh are focusing on parallel data transmission using array of LEDs, where each LED transmits a different data stream. Other group are using mixtures of red, green and blue LEDs to alter the light frequency encoding a different data channel. Li-Fi, as it has been dubbed, has already achieved blisteringly high speed in the lab. Researchers at the Heinrich Hertz Institute in Berlin, Germany, have reached data rates of over 500 megabytes per second using a standard white-light LED. The technology was demonstrated at the 2012 Consumer Electronics Show in Las Vegas using a pair of Casio smart phones to exchange data using light of varying intensity given off from their screens, detectable at a distance of up to ten metres.

In October 2011 a number of companies and industry groups formed the Li-Fi Consortium, to promote high-speed optical wireless systems and to overcome the limited amount of radio based wireless spectrum available by exploiting a completely different part of the electromagnetic spectrum. The consortium believes it is possible to achieve more than 10 Gbps, theoretically allowing a high-definition film to be downloaded in 30 seconds.

II. WORKING TECHNOLOGY

The LEDs can be switched on and off very quickly, which gives nice opportunities for transmitting data." So what you require at all are some LEDs and a controller that code data into those LEDs. We have to just vary the rate at which the LED's flicker depending upon the data we want to encode. Further enhancements can be made in this method, like using an array of LEDs for parallel data transmission, or using mixtures of red, green and blue LEDs to alter the light's frequency with each frequency encoding a different data channel. Such advancements promise a theoretical speed of 10 Gbps – meaning you can download a full high-definition film in just 30 seconds. Simply awesome! But blazingly fast data rates and depleting bandwidths worldwide are not the only reasons that give this technology an upper hand. Since Li-Fi uses just the light, it can be used safely in aircrafts and hospitals that are prone to interference from radio waves. This can even work under water where Wi-Fi fails completely, thereby throwing open endless opportunities for military operations.

Imagine only needing to hover under a street lamp to get public internet access, or downloading a movie from the lamp on your desk. There's a new technology on the block which could, quite literally as well as metaphorically, 'throw light on' how to meet the ever-increasing demand for high-speed wireless connectivity. Radio waves are replaced by light waves in a new method of data transmission which is being called Li-Fi. Light-emitting diodes can be switched on and off

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DOI:10.9756/BIJSESC.8241

faster than the human eye can detect, causing the light source to appear to be on continuously.

Figure 1: Li-Fi Enviorment

A flickering light can be incredibly annoying, but has turned out to have its upside, being precisely what makes it possible to use light for wireless data transmission. Light-emitting diodes (commonly referred to as LEDs and found in traffic and street lights, car brake lights, remote control units and countless other applications) can be switched on and off faster than the human eye can detect, causing the light source to appear to be on continuously, even though it is in fact 'flickering'. This invisible on-off activity enables a kind of data transmission using binary codes: switching on an LED is a logical '1', switching it off is a logical '0'. Information can therefore be encoded in the light by varying the rate at which the LEDs flicker on and off to give different strings of 1s and 0s. This method of using rapid pulses of light to transmit information wirelessly is technically referred to as Visible Light Communication (VLC), though it's potential to compete with conventional Wi-Fi has inspired the popular characterization Li-Fi.

A. Visible Light Communication (VLC)

"A potential solution to the global wireless spectrum shortage"

LiFi (Light Fidelity) is a fast and cheap optical version of Wi- Fi, the technology of which is based on Visible Light Communication (VLC).[4]VLC is a data communication medium, which uses visible light between 400 THz (780 nm) and 800 THz (375 nm) as optical carrier for data transmission and illumination. It uses fast pulses of light to transmit information wirelessly.

The main components of this communication system are

1. A high brightness white LED, Which acts as a communication source and
2. A silicon photodiode which shows good response to visible wavelength region serving as the receiving element? [3]LED can be switched on and off to generate digital strings of 1s and 0s. Data can be encoded in the light to generate a new data stream by varying the flickering rate of the LED. To be clearer, by modulating the LED light with the data signal, the LED illumination can be used as a communication source. As the flickering rate is so fast, the LED output appears constant to the human eye. A data rate of greater than 100 Mbps is possible by using high speed LEDs with appropriate multiplexing techniques. VLC data rate can be increased by parallel data transmission using LED arrays where each LED transmits a different data stream. There are reasons to prefer LED as the light source in VLC while a lot of other illumination devices like fluorescent lamp, incandescent bulb etc. are available.

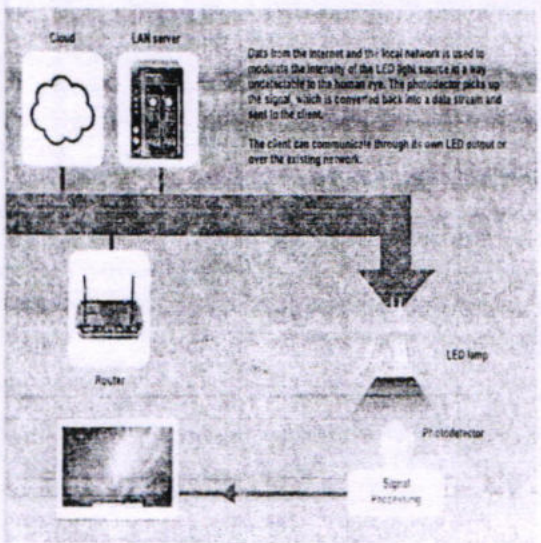

Figure 2: Data transmission using LED

III. COMPARISON BETWEEN LI-FI & WI-FI

LI-FI is a term of one used to describe visible light communication technology applied to high speed wireless communication. It acquired this name due to the similarity to WI-FI, only using light instead of radio.[5]WI-FI is great for general wireless coverage within buildings, and [5]li-fi is ideal for high density wireless data coverage in confined area and for relieving radio interference issues, so the two technologies can be considered complimentary.

Table 1: Comparison Between Current and Future Wireless Technology

S.No.	Parameter	Li-fi	Wi-fi
1.	Speed	> 1 GB/s	Around 150mb/s
2.	Medium of data transfer	Use light as carrier	Use radio spectrum
3.	Spectrum range	Visible light has 10000 times more	Having less spectrum range than VLC
4.	Cost	Cheaper	Expensive
5.	Network topology	Point-to-Point	Point-to-Point
6.	Operating Frequency	Hundreds of Tera Hz	2.4 GHz

the current wireless technologies that can be used for transferring data between devices today, i.e. Wi-Fi, Bluetooth and IrDA. Only Wi-Fi currently offers very high data rates.

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Intelligent Fire Extinguisher System

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Abstract— **Fire accidents can take place more in areas like houses, industries, Movie theaters, shopping malls, hospitals, etc., which will lead to more loss in life along with properties. Generally waiting for a fire engine to extinguish fire, may be delayed which may increase the chance of loss in life. There are so many preventive mechanisms have been developed to prevent/reduce the fire accidents to some extent. But always automatic solution brings more accuracy to protect lives from fire accidents.**
Fire extinguishing system is an automated system, which is used for detection and removing of fire automatically without human being Effort. The System presents two type of facilities for fire detection. One is through Sensor technology and other one is through broadcasting of Video in that particular place. All these together are split into various sub-modules for step-by-step development and implementation. Those include Sensors' Module, broadcasting Module, IP based Communication (Through Wi-fi module), PC-based application.

Keywords: **Techniques, Applications, Limitations, Case Study.**

I. INTRODUCTION

Intelligent buildings are expected to be safer, convenient, and efficient living environments for society in the 21st century. An intelligent building system (IBS) is integrated by many services and subsystems. One of the most important subsystems is the fire-detection function system in an intelligent building.[2] The purpose of our project "Intelligent Fire Extinguisher System" is to extinguish a flame in a certain amount of time. Our system detects the fire location and tries to extinguish the fire with the help of sprinklers. As begin a "Intelligent System" it cut offs the electricity of area where fire has been caught and starts the sprinklers only of that area.

II. TECHNOLOGY/METHODOLOGY

In this project, an automatic fire detection and extinguish solution is implemented by using Embedded systems and sensor technology. This automatic solution will respond in time, when fire is detected and will save many lives by sprinkling the water on the fire. The System presents two type of facilities for fire detection.

i. Sensor Technology:-

A smoke sensor is used to detect the fire occurred in the room and it will intimate to the control circuit via electrical signals. Now the control circuit will automatically drive the motor in the sprinkler and sprinkle the water on the fire. Generally this control circuit uses analog to digital converter to convert the analog output from the sensor into digital, processed and then finally drive the sprinkler system.

ii.Broadcasting Technology:-

One Camera is used for taking live video of that particular area and it is fitted on the automated vehicle, which move automatically in that place. One wi-fi module is used for broadcasting the live video. Now the user will see the broadcast and if Fire will be there then user can be controlled through PC. The control circuit will automatically drive the motor in the sprinkler and sprinkle the water on the fire.

In this project, AVR family (ATMEGA 8/ ATMEGA 16) microcontroller is used as a main controller for the control circuit of the system. The Microcontroller itself contains inbuilt 10-bit ADC, so that, it will reduce the size and cost of the system. An uln2003 is used to drive the DC motor by allowing the motor current through, which is not allowed in the microcontroller. A gas/smoke detector sensor is used to detect fire and fed the information to the ADC which is available in microcontroller. Camera is used for Broadcasting through wifi technology and PC is used for tracking and controlling the fire extinguishing system.

Important tasks

1. Interfacing Gas sensor or fire sensor with Controller.
2. Interfacing Camera with controller.
3. Interfacing Wifi module with controller
4. Interfacing DC motor with MSP430 MCU using ULN2803.
5. Controlling through PC (Manual Control).

III. REQUIREMENTS

Hardware:

Microcontroller(Arduino Board)
DC Motor
Wheel
Motor Driver IC
Robot Base
Sensors

IFERP

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Software:
Code in Embedded C

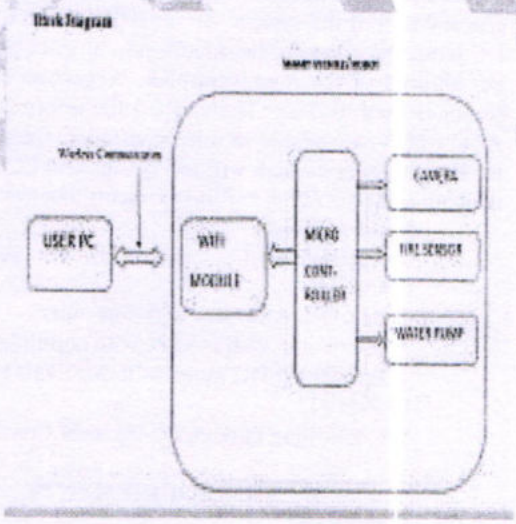
VI. ADVANTAGES

- To save people from injury or death, building.
- Automated Fire extinguisher for controlling fire in less time.
- *Extra Feature*
- It sense the fire and information is given to the admin person of building through message communication.

V. APPLICATION

- We propose live video broadcasting using wireless communication through wifi technology
- We propose the system by control and monitoring using IP address (through wifi module and PC).
- It can be small automated system in every building for saving of life from fire.

BLOCK DIAGRAM



VI. CONCLUSION

The prototype we have planned will work as

- Fire detect through broadcasting and control through user command.
- Fire detect through sensor and remove automatically.
- The conclusion is to provide security of home, laboratory, office, factory and building is important to human life.

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Inspecting the Results of Renewable Energy Source of Solar Botanic Trees Using Nano Piezo Electric Elements

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Abstract--- *The world is suffering under the severe shortage of reliable and efficient energy resources. The environmental friendly energy resources used to generate electricity so far. Thus, as a result we are seeing greenhouse effect and global warming and there is an immediate call to change over to an environmental-friendly energy resource i.e., 'the Renewable Sources. It eliminates the problems faced by a ancient solar panels. In case of Solar Botanic Trees, if the wind force is high, then the more Nano-leaves are moved. Nano piezo-electric elements associated in the petiole twigs and branchesare the tiny Nano piezo-electric elements that will generate Pico watts of energy as these thousands of Nano leaves flap back and forth due to wind. The stronger the wind force, the higher the "overlap" frequency, and therefore the larger the watts of energy generated in the petiole, twigs and branches. The mechanical vibrations in these mini generators produce electricity from movement of botanic tree leaves or kinetic energy caused by wind or falling raindrops.*

Keywords--- *Fossil fuels, Nano leaves, Piezoelectric, Reneuable source, Generators, Energy, Solar Botanic Trees.*

I. INTRODUCTION

NATURAL resources are fast depleting. With a drastic increase in the price of fossil fuels, we should need alternative resources to go on with our daily activities. While we scratch our heads thinking of various ways to reduce our carbon foot print, solar botanic trees has given a unique solution called Energy Harvesting. Trees that will provide renewal electricity through solar and wind energy using botanical trees. Several Renewable Sources are considered as an alternative for the present energy unavailability. However, they have some limited applicability. Energies like Hydro energy, Wind energy, Solar energy are all renewable energy resources applications. But, several drawbacks are posed by these sources like

- Costlier manufacturing.
- High installation and maintenance cost.
- Environmental dangers.
- Decrease in property and land values.
- Building modulation.

There is no difference between fake tree and real one. If woodpecker makes a hole, then the material used inside the tree will get destroyed. Thus, we will present a new method of elcubarating how we can use today's technology in a more efficient and effective way without causing any environmental pollution and the concept shown in this paper will give a various design techniques in renewable energy sources.

II. BIO-MIMICRY

Our solution is primarily based on the principle of 'Distributed generation'. This solution is loosely based on the principle of Bio mimicry is an emerging discipline that studies nature's best ideas and then imitates these works of design and processes to solve human problems. It is the practice of developing renewable human technologies inspiered by the nature.

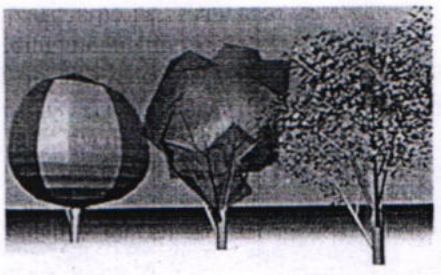

Fig. 1: Botanic Trees

We have abundant examples around us inspired by nature like Bionic Car: Daimler Chrysler has developed a new car concept from Mercedes-Benz based on the shape of an old tropical fish the Bionic Car. Using the shape of the tropical boxfish, designers introduced a modernised ideal that boasts 20% less fuel consumption and as much as an 80% of nitrogen oxide emissions are reduced. The diesel-powered compact will get about 70 miles per gallon, and can run just fine on biodiesel fuel.

III. SOLAR BOTANIC TREES

Solar Botanic will introduce substitute trees that will use renewable energy from the sun and wind, they are an efficient clear and environmental sound mean of collecting solar radiation and wind energy. This plan will collectively bring3 different energy generations together. They are

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- Photovoltaic (PVS) are series of cells containing a material that converts sun radiation into direct current electricity. Materials presently used for photovoltaic are amorphic silicon, polycrystalline silicon, microcrystalline silicon, cadmium telluride etc.
- Thermoelectricity refers to a group of phenomena in which a difference in temperature creates an electric potential or a electric potential creates a difference in temperature.
- Piezoelectricity is the ability of some materials to produce an electric field or electric potential in response to applied mechanical stress.
- Traps the power of the sun, conjoin all aspects of a tree such as leaf, branch and twigs and convert sun energy to electricity to power cities, auto and highways. In this bio mimicry conceptal view our trees are fitted with Nano leaves, a combination of Nano-photovoltaic, Nano-thermo and Nano-piezo generators converting light, and heat into green electricity.

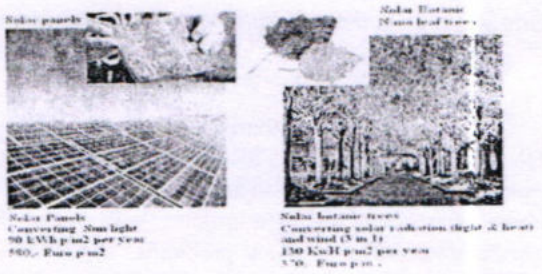

Fig. 2: Solar Panels Compared to Solar Botanic Trees

IV. NANO LEAF

The fundamental element in this technology is Solar Botanic's artificial leaf called the 'Nano leaf'.

- Nanoleaf consists of a very thin photovoltaic film on one side, which converts the light from the sun into energy.
- The other side of the nano leaf contains thin thermo voltaic film that converts the heat from the solar energy into electricity.
- In addition to solar power, as whispering wind or falling rain disturbs the false leaves, Nano generators in their petioles. The stalks connecting them to a branch should generate small amounts of piezoelectric power. A Nano leaf is slinky like a feature weight like a natural leaf, when external forces, like the wind force, forcing the Nano leaf to move back and forth, then the mechanical stresses will appear in the petiole, twig and branches. When thousands of Nano leaves overlaps back and forth due to wind force, millions and millions of Pico watts of energy will be generated, if the wind force is high then the more energy is generated. Our Nano leaves only reflect a small part of the sunlight that strikes them, commonly the green light, and the rest of the spectrum is effectively converted into electricity.

Fig. 3: Photo Voltaic Energy Conversion in Nano Leaves

With converting the visible spectrum of light, our Nano leaves also convert the invisible light like infrared light or radiation, we can't see it, but we can feel it- it is so warm so only we call it as radiation. Due to the rear combination of photovoltaic and thermo voltaic in our Nano leaves which converts this thermal radiation into electrical energy, even after the sunset. If the wind force is high then the more Nano leaves are moved. Wind force that is moving thousands of Nano leaves in a tre e covering are causing mechanical stress in the petiole, twigs and branches. Nano piezo-electric elements intergrated in the petiole twigs and branches are the mini Nano piezo-electric elements that will generate millions and millions of Pico watts of energy as these thousands of Nano leaves move back and forth due to wind. The stronger the wind, the higher the "overlap" frequency and therefore the larger watts of energy is generated in the petiole, twigs and branches.

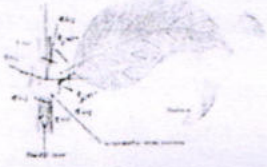

Fig. 4: Process of Green Energy Producer

With the voyage in Nano technology, the photovoltaic, thermo voltaic and piezo electric materials are becoming more adequate and are combined in one system to give our products more efficiently and we believe that soon, Solar Botanic will be a mainstream green energy producer, more reliable or cheaper and above all better looking.

V. TYPES OF NANO LEAFS

- *Broad and wide spread Leaf trees:* These variety provide electricity that ranges between 3500kWh to 7000kWh per year. They provide shade by cooling the environment, green environ and much more. Ever green trees- this variety can provide between 2500kWh and 7000kWh per year. They can be placed as single tree or to chain garden properties.
- *Shrubs, Plants, Roof, Wall and Fencing:* A vast range of shrubs are required for electrical needs. Nano leaf roof matting can be installed in minutes on any roof design. For fencing Wall runners are easy.

VI. CAPACITY OF BOTANIC TREES

An regular tree with a canopy of about 6 sq. meters can create sufficient energy to provide for the needs required by an average household and a tree with a 20 ft solar canopy could generate enough power range between 2000 and 12000 KWh

per year. An intermitting operation over two decades could produce 1, 20,000KWh of energy. On a larger scale, a kilo meter of solar botanic trees would be able to produce approximately 350,000 kWh per year, sufficient energy to power approximately 60 average size houses. Solar Botanic solutions offer up to 50% more power than conventional solar systems.

VII. APPLICATIONS

- It can be installed in Urban and Rural areas.
- Effectively used in Recreational parks, city parks
- New housing estate.
- Mountainous regions
- Coastlines
- Highways
- Airports
- Penthouses, balconies, verandas private gardens.
- De-forested areas where no more trees can be cultivated.
- Lands of commercial interest; Islands, surrounding nature tourist trap like resort.
- Ponds, lakes, seas and oceans
- Crop Protection
- Solar Botanic flowering plants to yielding colourful your electric power. Solar Botanic can be used for: Wind shield, Shade, anti-blaze, objectionable views, sound barrier, windbreak, wind blockage and much more.

VIII. BENEFITS

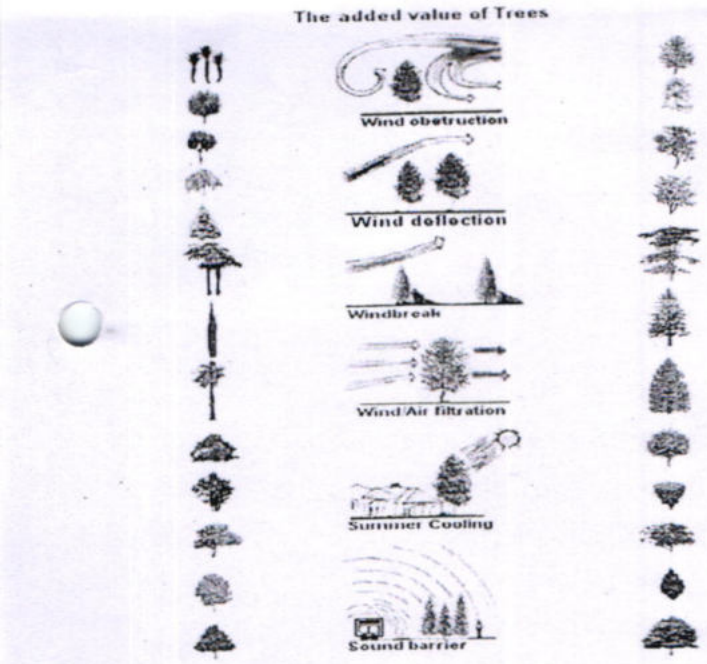

Fig. 5: Botanic Trees at Different Weather Conditions

IX. CONCLUSION

India is the 2nd largest country of the world, the increasing demand of the energy has forced the mankind to find a way will be efficiently and abundantly available source of energy. As the solar botanic trees is a non-conventional source, we have many benefits of producing electricity compared to the other resources. Green Energy is the need of the hour and it is our responsibility to ensure a secure a safer planet for the future generations. It is therefore fundamental responsibility of the citizens of the earth, or shall we say mankind to think smart and take the right decision. Everything starts with an individual, work together with the government and see your progeny enjoy the fruit of your action make life favorable for sustenance for mankind.

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Inhibition of Corrosion of mild steel in 2M HCl by Determination of optimal experimental parameters using Factorial Design - A preliminary study

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Abstract : A preliminary study to investigate the effect of Pongamia minnata seed oil on the errosion inhibition of MS by weight loss method. This was increased by the applying 2^3 factorial design. The communicating possessions of concentration, reaction time, and temperature on inhibition were investigated; the input factors and output response were also optimized. Maximum inhibition efficiency of 94.27 % was achieved at low temperature of 27 ^{0}C, reaction time of 4 days and inhibition concentration of 10 %v/v. A combination of statistical analysis, the Pareto chart and normal possibility chart and the main effects and the interaction effects has been employed to obtain an in depth understanding of the corrosion variables. Analysis of variance on the corrosion constraint shows the fitness of this model. It can be determined that factorial design is adequately relevant in the optimization of process variables and the inhibitor Karanj (Pongmia pinnata) seed oil, adequately reserved the errosion of MS(mild steel) at the given surroundings of the investigation.
KeyWords : Factorial, Karanj.

1.0 Introduction

Pongamia pinnata is a class of family Leguminasae, inborn in tropical and temperate Asia. Commonly called as karanja. Karanja is dearth resistant, semi-deciduous, nitrogen fixing leguminous tree. It grows about 15-20 meters in height with a large canopy which spreads equally wide. The leaves are soft, shiny burgundy in early summer and mature to a glossy, deep green as the season progresses. It has various excellent therapeutic possessions. Its wood is used as fuel and various useful purposes. Its oil is a thick yellow – orange to brown extracted from seed. The oil is being used as fuel for cooking and lamps, as oil, insect killer and in detergent making industries. The crude oil is being analyzed as biodiesel[1].

In this work, Pongamia pinnata oil has been used to study the errosion inhibition of MS in acid medium. A full factorial design is used for the experiments and a polynomial equation is developed to relate the inhibition efficiency to the variables such as inhibitor concentration, time and temperature. The validity of the model is evaluated by the analysis of variance

2.0 Experimental

Pongamia pinnata seeds were cleaned, deshelled and dried at high temperature. The oil is extracted by soxhlet extraction method. Separated oil was dried over anhydrous sodium sulphate[7]. The physicochemical properties of karanja oil was performed according to the standard methods of AOAC, 1998 are shown in the table-1.

Table-1: Physicochemical analysis of Pongamia pinnata seed oil

Sl. No.	Parameters	Values
1	Specific Gravity	0.921
2	Water Content %	0.0498
3	Carbon Residue	0.79
4	Ash content %	0.05
5	Iodine Value	86.46
6	Saponification value	84.9
7	Flash Point (°C)	212
8	Cetane Number	38

All corrosion inhibition data were obtained through weight loss experiments based on mild steel of surface area 5x1cm^2. The blank solution was 2M HCl. From the stock solution of the extract, different concentrations of the inhibitor test solutions ranging from 2% to 10 % v/v were prepared[1]. The samples in triplicate were immersed in 2M hydrochloric acid solution containing various absorptions of the inhibitor for 24 hours and 96 hours at 303 and 313 K. The samples were removed washed with water and dried. The physique of the samples earlier and later dipping was determined using an electronic digital balance[4].The errosion rate for various concentrations of inhibitor was obtained from the formula[2,3].

3.0 Factorial Design

A full factorial design with three variables temperature, concentration and time was used for the experiments. The experiments were conducted as per standards to investigate the given parameters affecting significantly the errosion rate and also the autonomously manageable chief process parameters. 2 stages of each of the 3 aspects were used for the statistical investigation. The treatment combinations for the two levels and 3 factors are tabulated in Table-2. The small & great heights for the aspects stayed nominated bestowing to some primary tests. The direction in which the investigations were made was randomized to avoid orderly errors. A full factorial design with three variables [Amount of inhibitor % v/v, Reaction time (minutes) and temperature (k)] is shown in the table-3. The optimum values of the variables were calculated with MINITAB 15

Table -2 Factorial design of the corrosion process showing treatment combination

Variables	Actual value		Coded value	
	Low level	High level	Low level	High level
Inhibitor (%v/v) (A)	2	10	-1	+1
Reaction time (days) (B)	1	4	-1	+1
Temperature ^{0}C (C)	27	30	-1	+1

Table-3- 2^3 full factorial design with statistical parameter design and the results

Inhibitor concentration (%v/v)	Reaction time (days)	Temp.(^{0}C)	IE (%) Trial-1	IE (%) Trial-2	IE (%) Trial-3	Average Inhibition Efficiency (%)
2	1	27	55	56.21	54.56	55.26
10	4	27	94.81	95.22	94.12	94.72
10	4	30	74.23	74.76	74.54	74.51
10	1	30	66.65	66.72	66.87	66.75
10	1	27	86.75	87.21	86.54	86.83
2	4	30	43.12	43.23	42.75	43.03
2	1	30	34.71	35.12	35.67	35.17
2	4	27	63.85	63.01	62.76	63.21

A mathematical expression to describe the design matrix combination mentioned in table-1 as low and high level of each factor and its corresponding corrosion rates mentioned in table-3 in code :corrosion Rate = f (A,B,C) Where A is inhibitor concentration, B is the time and C is the temperature[4]. The above model contains the properties of main variables1st order and 2nd order connections of all variables. Therefore the general model equation is given as[7][7] :

Corrosion Rate $= \beta_0 + \beta_1 * A + \beta_2 * B + \beta_3 * C + \beta_4 * AB + \beta_5 * BC + \beta_6 * CA + \beta_7 * ABC$

Where β0 is the average response of corrosion Rate and β_1, β_2 β_3, β_4, β_5, β_6 and β_7 are coefficients associated with each variables A, B, C and interactions. The deterioration coefficients and the accompanying affects are shown in tables-4. The significant factors are known by analysis of variance method. Based on the investigational results, a various linear regression model is developed and the effect of 95 % sureness levels for the extract is accessible in the table 4.

Table-4: Statistical parameters for 2^3 design

Factor	Degree of freedom	Coefficient	Effect
Average		65.00	
Inhibitor Concentration	1	16.00	32.00
Time	1	3.75	7.50
Temperature	1	-10.25	-20.50
Inhibitor concentration *Time	1	-0.25	-0.50
Inhibitor concentration * Temperature	1	0.25	0.50
Time * Temperature	1	2.50	5.00
Inhibitor concentration * Temperature * time	1	-0.00	-0.00

A reversion produced launches connection among the important positions attained from analysis of variance, namely temp, inhibitor and reaction time on the corrosion rate were statistically significant. Substituting the coded values of the variables at a given experimental conditions in the above equation the corrosion rate vales for the corrosion control behavior of the mild steel can be calculated. The developed model equation is expressed as

Corrosion Rate = 65.00 +32.00 A +7.50 B -20.50 C – 0.50AB +0.50 BC +5.00 AC -0.00*ABC

The above equation has been used to predict the errosion rate of the MS. The results of the linear regression model table -4 for pongamia oil displayed the inhibitor is the maximum significant variable with the key consequence of +32.00 miles per year followed by temperature (C) with -20.50 mpy and time B with +7.50 mpy. The deterioration discovered that temperature negatively impacted the inhibition efficiency of Pongamia seed oil on MS. The influence of inhibitor concentration was most pronounced as seen from the value of coefficient of that variable in comparison with the other . It can be resolved that once the outcome of a factor is positive an growth in the cost of the inhibition competence is detected when the factor changes from small to great level. In difference, if the effect is undesirable, a decrease in inhibition competence happens for great level of same issue.

3.1 Analysis of Variance

The results of analysis of variance are obtainable in the table-5. The analysis was estimated for a assurance level of 95 % for significance level of $F_{0.05}$=5.59,all possessions giving F greater than 5.59 have statistical meaning. The F –value for all models was more than 0.05, except for interactions. From the table-6 it is observed that the temperature (C), inhibitor (A) and time (B) are significant model positions inducing errosion rate of MS, since they have obtained F- value more than 0.05. Although the interaction effect was measured statistically irrelevant since their F- values are less than 0.05.

Table- 5 Analysis of variance-full fitting model for Castor seed oil

Factor	Sum of squares	Degree of freedom	Mean square	F value	P -value
Inhibitor concentration	2048.0	1	2048.0	9.19	9.19
Time	112.5	1	112.5	0.51	0.517
Temperature	840.5	1	840.5	20.63	20.63
Interactions					
Inhibitor concentration *Time	0.5	1	0.5	0.00	0.964
Inhibitor concentration *Temperature	0.5	1	0.5	0.03	0.877
Time * temperature	50.0	1	50.0	0.00	0.770
Residual	0.00	2	311.200		
Total	3052.00	7			

The various parameters selected for the validation test are revealed in the table -6.The effects of the validation tests stood found and comparisons were ended among the actual corrosion rate ideals and projected values[6-7]. The model predicts much more increase in inhibition efficiency increase with high and low levels of A, B and C temperature though small (Sl. No. 1,3 and 5) , also decrease in % IE in serial No. 2,7 and 8

Table-6: Comparison of the Actual with the predicted result for corrosion inhibition of mild steel in 2 M HCl using Karanja seed oil

Sl. No.	Inhibitor concentration (% v/v)	Time (min)	Temp. (°C)	Inhibition Efficiency (%)	Predicted	Residuals
1	2	1	27	55.26	58.01	2.75
2	10	4	27	94.72	91.97	-2.75
3	10	4	30	74.51	77.01	2.5
4	10	1	30	66.75	65	-1.75
5	10	1	27	86.83	88.83	2
6	2	4	30	43.03	45.28	2.25
7	2	1	30	35.17	32.17	-3
8	2	4	27	63.21	61.21	-2

3.2 The Pareto Chart And Normal Probability Chart

The chief properties & their connections are realistically accessible by Pareto chart in Fig. 1. The erect stroke in Fig. 1 specifies least statistically significant result scale for a 95 % sureness level. Its detected for 95 % confidence level & 8 freedom grades, the t value is 2.82. Altogether values awarding an absolute value greater than 2.82, which are situated right of erect line, are significant. Analyzing the Pareto chart, it can be seen that the contact of concentration had the greatest effect on the corrosion inhibition of mild steel by pongamia oil. The second interaction affecting the errosion inhibition was the temperature followed by time and finally by (conc. &temp).

Usual probability plot has been be detached into two regions, the factors above 50% region are indicated positive coefficients effect and below 50% region indicated as negative coefficients effect. All these issues & connections signified as a circle are not significant and the effects shown as a square is significant. The main factors (A, B, and BC) are away from the straight line and are therefore considered to be real. A, B and BC on the right has a positive effect for corrosion inhibition. From fig. 12 the concentration (A) has largest effect because its point lies furthest after the line. The 2nd vital factor is duration (B) which is additional significant than C (temperature).

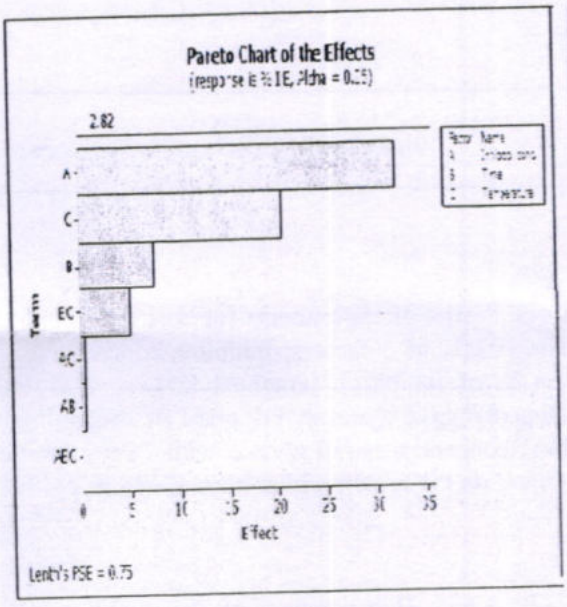

Figure-1
Pareto chart of the standardized effects for the corrosion inhibition of mild steel

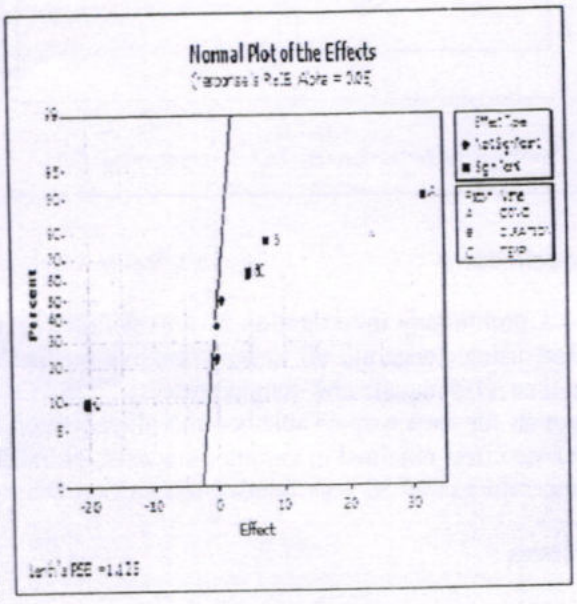

Figure2
Normal probability plot for the effects of input variables for each substance studied

3.3 The Main Effects And The Interaction Effects

Major variations that happen in the reaction (%IE) once the heights of every single of the key features are altered from small to great level are showed in diagram. 3. The statistical meaning of a issue is straight correlated to the size of erect line. Similarly it has noted that the higher the erect line, the more the variation in the reaction when altering the main factor beginning level -1 to level +1. Therefore, from Figure.3, it can be decided that the conc., and time have +ve effect on corrosion inhibition by pongamia oil, once 2 features are altered from small to great & the contradictory is true for the temperature. From the length of the erect lines, it is observed that the duration had the bottom effect on corrosion inhibition.

An interaction is real once the alteration in the result from small to great heights of feature is relied on the level of a 2nd factor, i.e., when the lines do not run parallel. Fig 4 shows the collaboration plots % IE of mild steel using pongamia oil. It can be understood that here is a strong interactional result among adsorbent quantity and temperature. Alternatively, the collaboration among the period and temperature was not effective.

As can be seen from Fig. 4, when the temperature is increased from 27 to 30°C, the % IE is decreased 74 to 35.17 at an inhibitor dosage of 10 (%v/v) and 4 days duration. Therefore, its decided that the result of low temperature is more distinct at high concentration of inhibitor and at long duration[4].

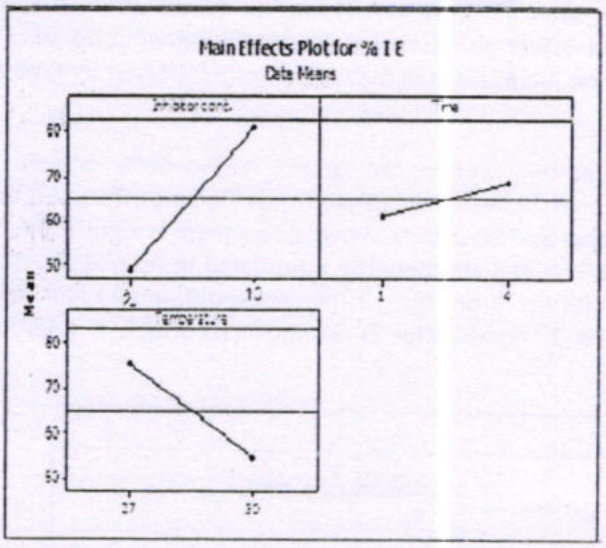

Figure-3
Main effects plot for % Effects Plot for % IE using pongamia oil

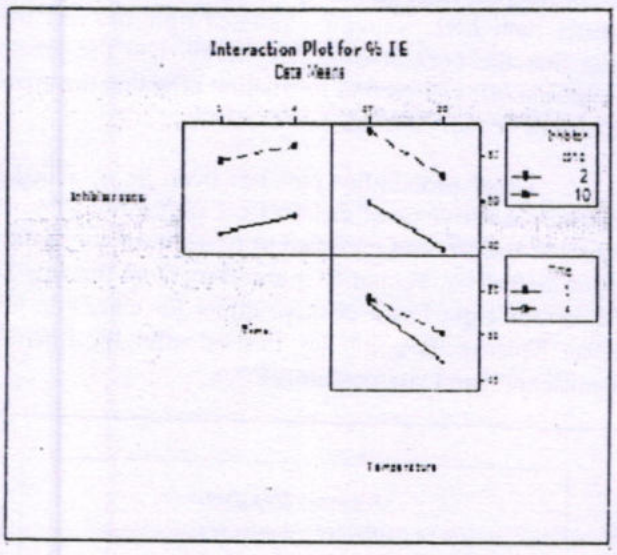

Figure- 4
Interaction effect plot for % IE using pongamia oil

4.0 Conclusions

A preliminary investigation is done with the factorial design of experiments for corrosion inhibition of mild steel using pongamia oil under corrosive media. The effects of 3 factors; inhibitor concentration (2-10 v/v%), time (1-4 days), and temperature (27-30 °C) on % of inhibition remained known. The statistical examination for each case established that the equation (Eq. (8)) gave a reasonably good fit. According to the significance effect obtained in variance analysis, the inhibitor concentration(10 v/v%), with 4 days duration and low temperature of 27 °C was found to have a significant effect on the errosion inhibition of MS in 2M HCl

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Glide Player – An Ad-hoc Media & File Sharing

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Abstract— **Seamless media sharing between individual mobile devices is not so easily achievable by current products. Most devices rely on having to share physical files with other devices wirelessly through file transferring applications. However, media is not always treated like most files. Media sharing is usually a temporary "for-the-moment" situation, where a user may need to play a file on another device easily and quickly, and after they separate, the file is no longer required to persist on the other user's device. Our proposed idea is for an application that can make such temporary, local media sharing quick and accessible, abstracting away the process of setting up a network and having to send each physical file between devices for a session and then have to delete the files after the session is complete. In our proposed application, users can create and connect to a logical group that is understood by the application and set up within the application. Once this group session is initiated, each user can freely explore the media library of each other user in the group and play any media file they so choose. By this method, the file is transferred over to the receiving device on demand and cached. This method does not require an internet connection or a nearby access point as each device could act as a local hotspot. In addition to this functionality, each user has the freedom to customize their privacy, specifying exactly which media files can be visible to other users and which files shouldn't be. Along with this, we also propose a mode of synchronous play which can be used by the group members to create one common queue of media that anyone can contribute to and that plays, seeks and skips at the exact same time on all devices if the users wish to experience media together, but without having to use a single common audio output; each user can just use their own device and audio output peripheral.**

Keywords: **Media, Ad-hoc, Android.**

I. EXISTING SYSTEMS

* There are already a lot of file sharing applications for mobiles out now.
* These apps lets people who are near each other to wirelessly copy files from one device to another
* But we've noticed two main things lacking in existing products.
* There are few applications that provide file sharing and functionality specific to media like music and videos
* Once you copy a file to another device, it is permanent. The other user can keep the copy and do whatever they want with it. Sometimes we need to share a file only temporarily and it should be deleted once the two devices move away from each other. Maybe because the file is confidential, or to avoid clogging the device with many shared files over time that the receiver forgets to delete.

II. INNOVATION

In this day and age of wireless connectivity, sharing media and files wirelessly between devices has quite comfortably become the norm for the current generation. What used to require using a physical storage medium such as a flash drive or optical disc can now be done easily using one of many wireless technologies that come built into most portable electronic computers.

However, there are 2 drawbacks to most mainstream solutions to file and media sharing these days. First, many solutions are designed to use the internet. One user can share their files with other's through a shareable cloud storage network like Google Drive or Dropbox. Although useful for sending files across large distances, these methods are unnecessary for quickly and efficiently sharing files between nearby devices, especially when there are restrictions on the bandwidth or data caps and charges.

The second drawback is that most solutions are built for permanently sharing a copy of the file. Sometimes a file only needs to be shared temporarily, and only as long as the users are within range. This could be a requirement when the receiver does not wish to keep copies of each file and also when the sender may not be allowed to legally share a copy of the file, or desires to keep the file confidential and only needs to share it with someone temporarily.

This application idea attempts to solve these issues. This application is built for quick, at-the-moment, media or file sharing with a larger focus on and specialized functionality for audio and video files.

III. SOLUTION

This application allows multiple users of the app who are within wireless range of each other to

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* Form a temporary network from within the app
* Be able to view and open any media or regular files on any other user's device in the group
* Customize which files or media is accessible to others

With the main focus on media files, the application will have built in media player functionality. This makes media related sharing more intuitive as the app presents a "library" view of audio and video files. Once connected to a group, the library is extended to show both local and remote media, giving to freedom to the user to select and play media on-demand. Until a file is opened, it does exist physically on the receiver end. When it is opened, the file is transferred and temporarily cached on the receiver's device. Finally, when the group is disbanded, all cached files are deleted.

For the focus on security, users could have the option to encrypt files that are being shared onto other devices. When a file is encrypted, it can be decrypted using a generated key that is unique to that particular group session. Once the session is closed, the key is destroyed and the file can no longer be accessed in case it is not already cleared from the cache.

For regular files, the app can provide a familiar "file explorer" interface, except that the user will be exploring accessible files on other user devices and as mentioned before, the file is transferred and cached only when it is chosen to be opened on the receiver device.

Another main proposed feature that not enough available products at this time consider is a mode of "synchronized play". With synchronized play, 2 or more devices in the group can be a part of one common session. Each user can contribute a media file to the session (or play queue), and once playback is started, the media files begin to play at the same time on all devices with minimal time difference and independent of who's device the actual file is present on. Any operation performed on the file, such as seeking time (forwarding or rewinding), skipping tracks, pausing or playing, are all done at the same time and on all devices. The process of copying the file to all devices, buffering and playing them at the same time is all handled by the application and abstracted from the users, allowing them to focus more on the experience.

IV. USE CASES

There are several situations when this application can prove to be a viable solution. Here are only a few examples chosen to try and convey not just use cases, but a clearer idea of what the app actually does and who it could be meant for.

* ***Social events and entertainment:***

Suppose a group of peers are together and want to be able to pool in their music or videos, but not necessarily have to project it onto one device like a TV or stereo. Each peer wants to contribute their own library of media or files to the group so that they can all explore each other's libraries on their own personal devices, or alternatively, be part of one common music or video session. The application turns group events into a cooperative sharing experience without the hassle of setting up an infrastructure, no requirement of peripherals and no requirement of a connection to the internet. Just open the app, connect and have fun.

* ***Quick file viewing for professionals:***

In the absence of a conference room and projector system, suppose a group of professionals want to share a quick document or video with each other and the only device available is each person's smartphone. All they need to do is open the app and connect and view the file from the owner's device. In situations where the file may be confidential, security is taken care of: once the group is disconnected, the file is no longer accessible by any of the other devices as the cache can be cleared and the file is encrypted to begin with.

* ***Band practice, quick music sharing:***

Another common scenario is a music group gathered to begin a practice session. Many such practice sessions begin with all members listening to a song before trying to re-create it with their own instruments. In the absence of studio/stage equipment like a mixer or speaker system, it may not be feasible for all members to listen to the audio from the relatively weak speakers of one device (the device that contains the song). The usual solution is to transfer the song to all members either to file sharing applications or uploading to a cloud storage that everyone accesses. Instead, each member only requires the application to be installed. Theyopen the app, connect, and all users can view the same song in a synchronized play mode and have it play at the same time on their own devices. Optionally, they can even use their own audio output like headphones to get a detailed hearing of the song but still be listening to it at the same time as everyone else.

V.TECHNOLOGY

The proposed application can be developed to work on Android devices, although it should theoretically work between any devices that can be connected to a Local Area Network and handle sending data over a TCP or UDP protocol and viewing or playing files. Wireless connectivity will be established through Wifi.

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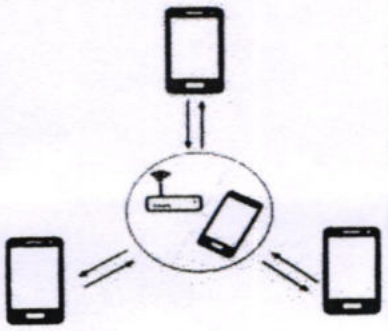
The virtual "group" or "sharing session" can be set up between instances of the app running on multiple devices over a LAN. This LAN can be created through one of the following ways:

1. All devices are connected through a wireless router
2. One of the devices creates a local hotspot and the other devices connect to it.
3. All devices join together in group using Wifi-Direct.

Although options 2 and 3 seems similar, the advantage with Wifi-Direct over a regular Wifi ad-hoc network/hotspot is that a Wifi-Direct group is easier to set up on android devices and, on devices with supporting hardware, the phone can be connected to a router and be part of a Wifi-Direct group at the same time, meaning no loss of connectivity to the internet.

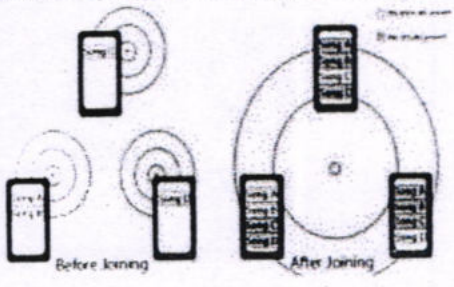


3 devices connected through an Access Point OR 4 devices connected through a hotspot set up on one device

Once the devices have created or joined a group, they exchange their libraries. A library defines the list of files present in one device along with meta-data such as size, artist, album etc.

When libraries of all devices have been exchanged each device now sees one large virtually merged library. From here, any device can access any file from any other device and it is accessed on demand.

The following diagram shows an example of how an available library of media files appears to each device



Example scenarios that can benefit from our application:

* Imagine a small group of people travelling together. They have limited internet access and there is no wireless router nearby.
* Suppose they are spending their time listening to music and they want to share their music with each other
* The only way to do this is to open a file sharing app, select the songs you want to share, and send it one by one to each other user. This is time consuming and difficult
* Also, the users want to be able to see each other's music library and play any song from any device as long as they are near each other.
* A second example. Imagine a group of professionals who want to review and discuss an important document like an excel report, or review some video or presentation.
* If there is no conference room tools like a projector nearby, it is difficult for them to share these files. All of them would have to crowd around one screen, or like the previous example, they have to share the file one by one to each device.
* What if there was an application that allowed users to simply connect, view each other's files temporarily, and after they are done, disconnect and continue without needing to keep a copy of the file?

Our app:

* We looked at these specific gaps in existing products and came up with the idea for our application.
* Let's break up and explain our project title.

oLocal: The sharing of media and files is only done when the devices are nearby. They are shared using a Local Area Network which means the app is best suited for temporary sharing and it doesn't need an internet connection.

oMedia and files: The app has special functionality to act as a media player, containing music and video libraries, but can also share other file formats if the user's device supports it

oSession: The sharing of these files is temporary and confined to the current session. Once the group is disconnected, all files are cleared and no extra space needs to be clogged.

Music and Video libraries:

* Before connecting to a group, the app behaves like a music and video app. It shows you a list of all media on your phone. You can queue them up and play them like a normal app.
* Once you connect to a group, the app looks the same, but now if you look at your music or video library, it will list a combination of media on your device AND media from other user's devices, almost as if it's on your phone

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* When you queue up and play media, if it is on your device, it plays immediately. If it's on someone else's device, it sends a request, starts fetching the file, buffers it and plays it with minimal delay.

Other files like documents:

* After connecting to a group. You can see all accessible files on other's devices (the ones they allow you to see). When you tap on a file, the file is fetches, cached and opens on your device using any app on your phone that can support the file format.

Synchronized media playback:

* This feature is something we haven't seem implemented yet on any other existing products.
* Instead of each user in a group just being able to see and play any media file from the group, synchronized playback allows all the users to share one common queue of songs or videos.
* Anyone in the group can contribute to the queue by adding any media file to queue.
* Once playback is started, the same item from the same queue will start playing on ALL devices at roughly the same time.
* Playback controls like play, pause forward, rewind is reflected on all devices at the same time
* This allows multiple users to view the same media from device, on their own phone at the same time, which is useful if many users want to watch a movie or listen to music together but don't have a stereo or TV nearby.

VI.FEATURES

* Security: We described the app being able to see and access all files on another user's device. Obviously not everyone will be comfortable with this. So the app lets the user choose which files can be seen by others which files cannot.
* The app also lets the user choose whether other users can save your file offline, or if they should only be able to view it while you are nearby.
* A third option is encryption. A user can choose to encrypt the file before sending to other devices. This way, the file can be decrypted only while you are nearby. Once the group is disconnected, decryption is no longer possible and so the cached files are useless.

VII. CONCLUSION

* Our Application is a file sharing and a media sharing app .
* It also provides a better security for the confidential files and a temporary connection between two devices and more .
* It can also be used to get permanent connection only if the owner allows the other person to access files .

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Future Aspects and Key Challenges of IoT

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***Abstract*— Embedded industry ensures well laid and efficiently advanced days of transparency in the near future ahead. It's the need as well as call of the hour that we initiate developing IOT configured products, so as to meet the customer needs. The count of people that IoT expects to connect is estimated to be around 28 billion —things to the internet by 2020, having diverse gadgets that range from wearable devices like smart watches to automobiles, embedded appliances, and industrial equipments. Several IoT solutions that have been enlarged so far, functionalities of them and also the technology used. Thereby, we conclude the various challenges that need to be focused on to pave the way to betterment of solutions that will aid the society.**

***Keywords*: Internet of things, RFID, IPv6, Wireless Sensor Network, Smart home.**

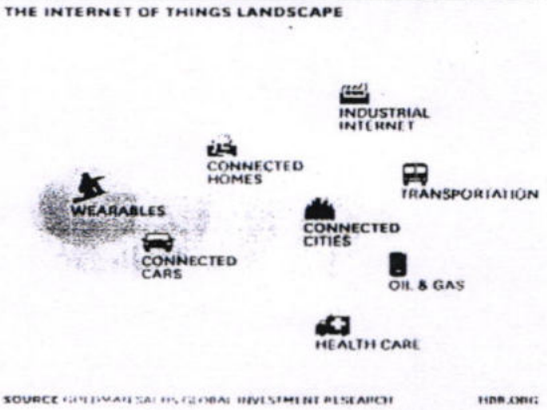
I. AN INTRODUCTION TO THE INTERNET OF THINGS:

The term-Internet of Things (IoT) was primarily coined around 1998 which defines as a network of networks where typically, a large number of objects or sensors are connected via communications and information infrastructure to provide value-added services. It ensured in developing a world where all the objects around us are internet accessible and therefore the communication to each other with redundant human intervention. The utmost goal is to create a better world for humans, where the objects around us acknowledge our desire and hence act accordingly without any external instructions. In a more common manner, it refers to a global, distributed network (or networks) of corporeal objects that are capable of sensing or acting on their environment, and able to communicate with each other, other machines or computers. Such 'smart' objects come in a wide range of sizes and capacities, including simple objects with embedded sensors, household Appliances, industrial robots, cars, trains, and wearable objects such as watches, Bracelets or shirts. All these things have certainly changed the entire look of the word connectivity. Internet of Things is on the peak of its existence and it is evident from its benign outcomes. From smart cities, ambience, healthcare, energy, vehicle, transportation, public safety to our day-to-day needs, Internet of Things has completely invigorated these fields.

II. PURPOSE OF IoT OUTCOMES

IoT sometimes is touted as similar to smart systems: smart put-ons, smart houses, smart townships, smart ambience, smart endeavors and the list goes on.

1. Smart Put-ons: Smart puts-on are networked devices that have the capability to collect data, track activities, and advance experiences to user needs and desires. Puts-on solutions are configured for a variety of functions as well as for where on a different of part of body such as the head, eyes, wrist, waist, hands, fingers, legs or embedded into different element of attire. .Puts-on devices are of two types, namely, One standard is based on product forms, including head-mounted (such as glass and helmet), body-dressed (such as coat, underwear, and trousers), hand-worn (such as watch, bracelet, and gloves), and foot-worn (such as shoes and socks). Another standard is based on product functions, including healthy living (such as sport wristband and smart bracelet), information consulting (such as smart glass and smart watch), and somatosensory control (such as somatosensory controller).



2. Smart Houses: Smart House is the technical blend of technology and services through home networking for a better quality of living. A lot of technologies related to Smart House are coming out. Result in this category ensures a complete and contented aura for the occupants as of today. Some smart home solutions also pay interest on giving assistance to the aged people in their day-to-day chores and on healthcare surveillance. Due to the huge market potential, more and more smart home solutions are making their way

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into the market. Areas of major focuses have been namely on resource management and related phases.

3. Smart Townships: A 'smart township' is a non-rural region that is immensely advanced in terms of overall structural design, maintainable real estate, communications and market viability. It is a city where IT is the principle infrastructure and the core for providing omnipresent services to residents. Many technological aspects are also keenly involved up-to a certain extent. As the need of the hour calls, it will prove to be a benign aspect in the very near future. Urban IOTs, in fact, are designed to support the Smart City vision, which aims at taking advantage of the most customized communication systems to aid added-value services for the admin of the city as well as to its denizens. The application of the IoT exemplar to an urban context is of particular interest, as it responds to the stalwart push of many national governments to adopt IoT solutions in the public affairs management, thus taking into conscience the so-called Smart City concept.

4. Smart Ambience: The Smart Ambience in a city comprises of Smart Governance, Smart Mobility, Smart Utilities, and Smart Buildings. Services enabled by the IOT exemplar in smart city environment might range from Monitoring health building, Management of waste, Monitoring air quality, Monitoring noise, Traffic bottleneck, smart parking , smart lightning, water quality management, natural disaster surveillance ,smart farming and many more.. WNA is a wireless landslide detection system that is capable of releasing alerts about possible landslides caused by torrential rain in the contemporary season. There are many more solutions available providing different ideas in different areas.

5. Smart Endeavors: Enterprise IoT solutions are advanced to support structural design and more general-purpose functionalities in industrial place. Current enterprise strategies already acknowledge a few interfaces to smart items, but because of increased computational as well as communication abilities of these gadgets, the power drifts towards the edges of the network. Intellectual mechanisms for data aggregation, filtering, fusion and conversion can be installed to and executed at the network edge, or within the network, as suitable.

Software is primarily the core innovation driver in many industries and many new business models of the future will heavily rely on the use of such items. Some of the most promising phases are Manufacturing, supply chain integrity, energy and production, health, transportation and logistics. Timely and optimal replacement strategies are determined from context information related to usage patterns.

III. IoT AS A METHODOLOGICAL FORTITUDE

There are three IOT components which enables seamless insidious computing:

a) Hardware - made up of sensors, triggers and embedded communication hardware

b) Middleware – on-demand storage and computing devices for data analytics and

c) Presentation – innovative and easy to understand mental picture and analysis tools which can be widely accessed on diverse podiums and which can be designed for several applications.

The IoT covers a enormous aspect of industries and applications.

1. Radio Frequency Identification (RFID)

RFID can be easily understood as a radio-frequency identification system that makes use of tags, or labels attached to the objects to be identified. Two-way radio transmitter-receivers called interrogators or readers transmit a signal to the tag and acknowledge its response. The readers usually transmit their observations to a computer running RFID software or RFID middleware. RFID tags can be either passive, active or battery assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery assisted passive (BAP) has a small battery on board and is activated when in the presence of a RFID reader. It is more consistent, competent, safe, cheap and precise. RFID has an extensive range of wireless applications.

2. Wireless Sensor Networks (WSN)

A wireless sensor network (WSN) is a collection of distributed sensors that observe corporeal or environmental circumstances, such as temperature, sound, and pressure. Data from each sensor passes through the network in a node-to-node fashion. The parts that sum up the WSN surveillance network consist of:

WSN nodes are inexpensive devices, so they can be developed in high volume. They also operate at low power so that they can run on battery, or even use energy harvesting. A WSN node is an embedded system that typically performs a single function (such as measuring temperature or pressure, or turning on a light or a motor). A WSN edge node is a WSN node that includes Internet Protocol connectivity. It acts as a gateway between the WSN and the IP network. It can also perform local processing, provide local storage, and can have a user interface.

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WSN Technologies: There are several candidates that can be selected as WSN technologies. Few of them are discussed here.

Wireless-Fidelity: The first immediate networking technology candidate for an IoT device is Wi-Fi, because it is so necessary. Obviously, Wi-Fi can be a benign solution for many applications. Almost every house that has an Internet connection has a Wi-Fi router. However, Wi-Fi needs a fair amount of power. There are numerous devices that aren't able to afford that level of power: battery operated devices, for example, or sensors situated in locations that are difficult to power from the grid.

IEEE 802.15.4: One of the major IoT enablers is the IEEE 802.15.4 radio standard, released in 2003. Commercial radios meeting this standard provide the basis for low-power systems. This IEEE standard was extended and improved in 2006 and 2011 with the 15.4e and 15.4g amendments. Power consumption of commercial RF devices is now cut in half compared to only a few years ago, and we are expecting another 50% reduction with the next generation of devices.

3. Addressing schemes

[The capability to solely recognize things is critical for the success of IoT. This will not only allow us to uniquely recognize billions of devices but also to monitor remote devices through the Internet. The few most critical features of developing a unique address are: exclusiveness, trustworthiness, perseverance and scalability. Every element that is already connected and those that are going to be connected, must be identified by their unique identification, location and functionalities. The current IPv4 may support to an extent where a group of sharing sensor devices can be identified geographically, but not on individual basis. The Internet Mobility properties in the IPv6 may improve some of the device identification problems; however, the mixed nature of wireless nodes, variable data types, parallel operations and union of data from devices intensifies the problem further IPv6's addressing scheme provides more addresses than there are grains of sand on earth. With IPv6, it is much simpler for an IoT device to obtain a global IP address, which enables efficient peer-to-peer communication.

4. Storage and Data analytics

Primary curb is that this immensely configured world will develop data at an exponential rate, even if not all the data is or ever will be interesting or priced. Storage of data, ownership and termination of the data become grave issues. Hence, data centers which run on harvested energy and which are centralized will assure energy fullness as well as trustworthiness. The data has to be stored and used intelligently for smart surveillance and trigger action. The basic value in an IoT system is in the ability to perform analytics on the gathered data and retrieve useful insights.

IV. CONFORNTATIONS IN BUILDING IoT

The solutions for IoT development confrontation needs to be arrived from methodological, public, legitimate, monetary, and business milieu.

1. Standards and interoperability

Standards are essential in creating markets for new technologies. If devices from diverse manufacturers don't use the similar standards, interoperability will be more difficult, requiring extra gateways to translate from one standard to another. Additionally, a company that observes different phases of a vertical market may overpower a market, stifling competition and creating obstacles for smaller players and entrepreneurs. Diversifying data standards can also tend to lock consumers into one family of products: if consumers can't easily transfer their data when they replace one device with another from a diverse manufacturer, they will in effect lose any advantage from the data they have been gathering over time.

2. Security.

As the IoT conjoins more devices together, it provides more decentralized entry points for malware and spam. Less expensive devices that are in physically compromised locales are more subject to disfigurement. More layers of software, integration middleware, APIs, machine-to-machine communication, etc. create more complexity and new security risks.

3. Trust and Privacy.

With remote sensors and surveillance a core use case for the IoT, there will be heightened sensitivity to controlling access and ownership of data. New compliance frameworks to address the IoT unique issues would be evolved. Social and political concerns in this field may also curb IoT adoption.

4. Complexity, confusion and integration issues.

With several podiums, n-number of protocols and huge numbers of APIs, IoT systems integration and testing will prove to be a key challenge. The confusion around evolving standards is almost sure to slow adoption. The exponential evolution of APIs will likely consume unforeseen development resources that will reduce project teams' abilities to add basic new functionalities. Slower adoption and unforeseen development resource requirements will likely slip schedules and slow time to revenues, which will require additional funding for IoT projects.

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5. Evolving configuration, protocol battles and competing standards

There may be several standards that evolve based on diverse requirements checked by device class, power requirements, capabilities and uses. This proposes opportunities for platform vendors and open source advocates to contribute and influence future standards.

6. Concrete use-cases and compelling value propositions.

Lack of clear use-cases will slow down adoption of the IoT. Although technical specifications, theoretical uses and future concepts may do for some early adopters, monotonous adoption of IoT will require well-grounded, customer-oriented communications and messaging around. Detailed explanations of a specific device or technical details of a component won't cut it when buyers are looking for a complete value-added service. IoT providers will have to explain the key pros of their services or face the consequences.

V. POTENTIAL OF IoT IN THE NEAR FUTURE

The advancement of IoT from haughty concept to reality is predicated on the projected advanced growth of smart devices and the joint of cheap infrastructure, connection facility and data. Declining device costs, widespread and persistent connectivity, and an exponential focus on operational efficiency and productivity is leading to widespread deployment of IoT solutions. This fast growth is based on expectations that the IoT will bring malleable pros to businesses and consumers. Those advantages can take different forms for denizens, for businesses and for governments. Consumers can get more personal product or service offers, based on what they actually do or where they are. They can travel more easily by avoiding traffic congestion when their connected car suggests an optional route, based on traffic reported by other vehicles. It can be monetarily beneficial. They can be healthier, safer and more independent due to puts-on devices that provide feedback on health or that monitor the aged in the home. Businesses can provide better products and services by studying how customers behave; they can also explore needs for new products or services. They can protect buildings via far-flung security; secure assets like cars and machinery with location trackers and remote locking devices; and ensure that sensitive products (e.g. pharmaceuticals) are consistently stored in right conditions. They can become more efficient, as in the case of utilities using smart meters to erase waste or loss, or in the case of equipment sellers providing just-in-time preventive maintenance. Farmers can be more productive with smart irrigation that provides water whenever needed. Governments and public authorities can also benefit from the IoT. Road safety can be ameliorated based on data from thousands of drivers. The efficiency of street lighting can be improvised by dimming lights on empty roads. As government works to deliver quality services in increasingly complex environments, devices that have already begun to make life more simpler and more efficient for companies and consumers can also aid create bigger public value.

VI. CONCLUDING REMARKS

The great potential of the IoT appears to be huge, in spite of the range of issues that need to be acknowledged. Section I, reviewed an overview about the IoT concept. Section II reviewed a set of the popular applications which are offered by IoT. Section III focuses on methodological fortitude for the realization of IoT. Section IV and V reviewed a set of challenges faced and future impact of IoT. It can be pondered that new research challenges arise due to the large scale of devices, the connection of the physical and internet worlds, the openness of the systems of systems, and continuing problems of privacy and security.

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Energy Saving Through Smart Home

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Abstract: **-- Energy saving is considered as one of the most important issue affects the consumers, power system quality and the global environment. The high energy demanded by home appliances, air conditioning and lighting makes homes to be considered as one of the most critical area for the impact of energy consumption. Smart home technology is a good choice for people not only care about security, comfort but energy saving as well. In this paper, a smart home energy management technique is presented. It minimizes the domestic energy waste and can be adapted according to the user habits. A proposed scenario is reported of daily routine and performed by 16 steps. Three assumptions of varying the time spent in each step according to different behavior are examined. The effectiveness of the proposed set is shown based on a static correlation between the power consumption and saving.**

Keywords:- **Energy saving, smart home, occupancy sensor.**

I. INTRODUCTION

Smart home technology started for more than a decade to introduce the concept of device and equipment networking in house. Smart home contains internal network and intelligent control on different home's services. The internal network can be built via wire or wireless communication technique between sensors and actuators. The intelligent control means the entire house is managed or monitored by internet services. Smart home is the integration of technology and services through home networking for a better quality of living. Integrating the home services as shown in figure 1 allows them to communicate with one another through the home controller, thereby enabling single button to control the various home systems according to preprogrammed scenarios or operating modes.

Smart homes have the potential to improve home comfort, convenience, security and energy management. Moreover, it can be used for elder people and those with disabilities, providing safe and secure environments. A smart home is a good choice for people caring about security, health, energy saving and convenience. The benefits of smart technology at home could be apparent to everyone if this potential is fulfilled. This is when the system will be able to protect habitant's privacy and having low cost.

On the other hand, smart home is somewhere difficult to be implemented due to its high initial cost.

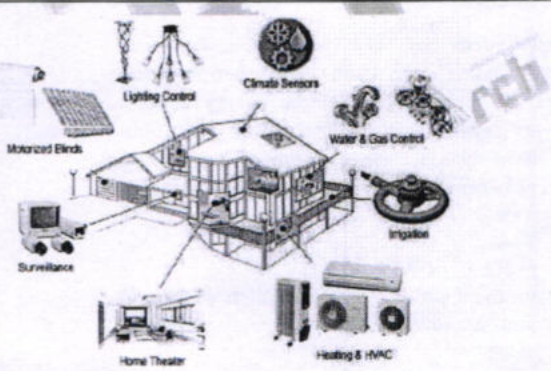

Figure (1): Smart home Integration services

In this paper a home energy management technique based on a set of sensors is presented. Section I is a brief definition of smart home and its benefits. Section II describes how smart home can reduce the energy consumption via managing intelligently the devices by controlling the lighting, air conditioning (HVAC) and other home appliances. In section III, a case study is reported. Section IV shows the proposed scenario with the assumption of daily consumption of power in home. Section V concludes with the total energy saving and taking India towards a better future.

II. ENERGY MANAGEMENT

One of the major benefits of smart home to consumers is their ability to incorporate energy

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management features through lighting, air conditioning and home appliances.

A. Lighting

The lights in a smart home can be turned on and off automatically based on occupancy sensor. Forexample, when a person enters a room in the day time, the system will open the drapes instead of turning on the lights, but at night it would make sure the lights came on and they turned off when no one is in the room hence waste of energy can be preserved.

B. Air Conditioning

An appropriate placement of temperature sensors and the use of heating and cooling timers can reduce the energy used and hence saving money and also the house can set to turn off air conditionings when no one is in the room.

C. Home Appliances

Smart homes can even go further in energy management by keeping track of the energy usage of each and every appliance in the house. The smart house controllers could schedule the operation of heavy power consuming appliances to take maximum advantage of off peak electric rates.

III. CASE STUDY

Figure 2 shows the apartment which consists of 6 rooms. Their dimensions are listed in table 1.

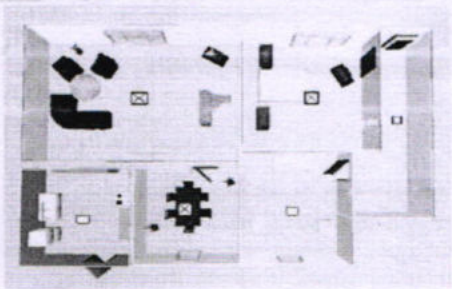

Figure (2): Layout of apartment indicating the distribution of sensors used

Table 1 Simulated Home Area

Total	Kitchen	Dining Room	Bathroom	Room	Bedroom	Entrance hall	Rooms
129	16	16	16	48	25	S	Area m:

The sensors are distributed into home in order to provide accurate information about the occupant's location and activities. Occupancy sensors are used instead of motion sensors because last ones are preferred for security rather than for building and lighting control. They respond only to moving objects, so if an individual in a room working at a desk, motion sensors will often cease to see him. Figure 3 shows the occupancy sensor.The first one is a passive infrared (PIR) sensor that automatically control lights by detecting the heat from occupants moving within an area (900 square feet) to determine when the space is occupied. The other, is used to adjust the temperature and lighting level accordingly for better energy management.Table 2 illustrates the number of sensor used per room and their distribution through the apartment is shown in figure 2.

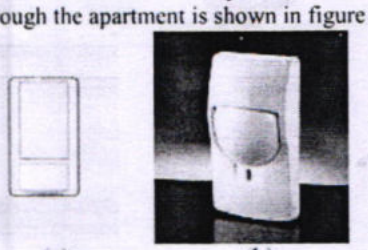

Figure (3) (a): occupancy sensor for lighting (b): occupancy sensor for lighting and hvac

Table 2 list of sensor per room

Total	Kitchen	Dining room	Bathroom	Living room	Bedroom	Hall	Target	Sensor type
3	1	0	1	5	0	1	Light Control	
3	0	1	0	1	1	0	Light +HVAC	

IV. PROPOSED SCINERIO

Scenario management allows users to define a set of behavior rules. A lot of sequences can be implemented according to the habitant's age and its social status. A scenario for an elderly house holder who has a high risk of falling down is proposed in. Furthermore, a scenario for an individual gets back at evening and leaving in the morning is suggested in. In this paper a scenario for a man and his wife getting back home and leaving in morning is presented.

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Wrong Behaviors	Action	Husband	Wife	Time	
	Hall is On		Back home	At 14 o'clock	1
Hall is left on for 30 minutes	Bedroom is On		Enters bedroom	14:14:30	2
	Hall is Off			At 14:30	
Bedroom is left on for 30 minutes	Bathroom is On Bedroom still On		Leaves bathroom	14:30-35	
	Bathroom bedroom Off			At 15 o'clock	
Living room is left on for 2 hours	Kitchen is On Living room is On		Enters kitchen	15-17	4
	Hall is On	Husband back home		At 17 o'clock	
	Living is On Bedroom is On	He enters bedroom	waiting her husband in living	17-17:30	6
	Hall is Off			At 17:30	
Bedroom is left on for 30 minutes	Bathroom is On Bedroom still On Living is On	He enters bathroom	still waiting her husband in living	17:30-35	7
	Bathroom, Bedroom Off			At 18 o'clock	
Dining room is left on for 30 minutes	Kitchen is On Dining is On Living is On	He is wating her into living	Enters kitchen to prepare brunch	18-18:30	8
	Dining is On	They enter the dining room for brunch		18:30-39	9
Dining room is left on for 1 hour	Kitchen is On Dining room still On Living room is On	waiting her into living room	Leaves the kitchen	18-20	10
	Kitchen Dining room Living room are Off			At 20 o'clock	
	Bedroom is On	They enter bedroom		20-21	11
	Living is On	They enter living room		21-23	12
Dining Room is left on for 1 hour	Kitchen is On Dining is On Living room is On	waiting in dining room	Enters the kitchen to prepare dinner	23-24	13
	Kitchen is Off Dining room is on	Enter the dining room for dinner		24:24:30	14
Dining Room is left on for 30 minutes	Kitchen is On Dining still On	Back to living room	Enters the kitchen	24:30-1	15
	Dining room Kitchen Living are Off			At 1 o'clock	
	Bedroom is On	Back to bedroom to sleep		1-2	16
	All rooms are Off			At 2 o'clock	

Table 3 Proposed scenario

Actually, the human habit cannot be controlled because it changes according to our life so the change of power consumption is related to the change of numbers of hours spent in each room and thus saving in KWH. The previous scenario listed in table 3 is adjusted three times and table 4 represents the number of hours spent in each room to realize each step of the 16 steps shown before during different habits assumptions.

Hour/step 3rd assumption	Hour/step 2nd assumption	Hour/step 1st assumption	Scenario Steps
1	1	1	1
0.5	0.5	0.5	2
0.5	0.5	0.5	3
2	0.5	1	4
0.5	0.5	0.5	5
0.5	0.5	0.5	6
0.5	0.5	0.5	7
0.5	0.5	0.5	8
0.5	0.5	0.5	9
1	1	1.5	10
1	1	1	11
2	2	3	12
1	0.5	0	13
0.5	0.5	0	14
0.5	1.5	0	15
1	0.5	0	16

Table 4 Time spent in each step

Total	Kitchen	Dining Room	Bathroom	Living Room	Bedroom	Hall	
129	16	16	16	48	25	8	Area/m^2
0.896	0.133	0.088	0.133	0.278	0.176	0.088	Light KWH/day
7.94	0	2.11	0	3.56	2.27	0	HVAC KHB/day
							Home
1200.2	1.200	0	0	0.16	0.11	0	Appliances KWH/day

Table 5 Power Consumption Per Room

Table 6 is a comparison between the previous assumptions listed in table 4 showing in each, the power consumption, percentage saving in power and consequently in electricity bill. The results shown in figure 5 confirm that the proposed energy management smart home can be adapted each time the occupant's habit change and thus the saving target.

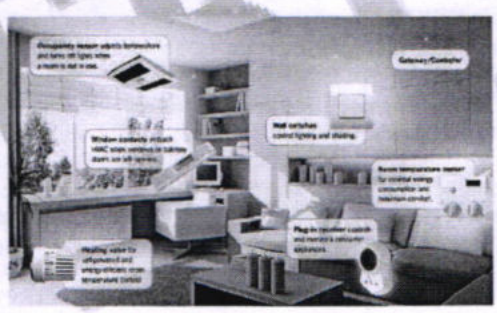

Figure (4): Living room lighting

3rd assumption	2nd assumption	1st assumption	
1549.08	1858.23	935.31	Total KWH/month
619.2	379.47	224.13	Total saving KWH/month
38.58 %	20.42 %	23.96 %	% saving/month
48.82 %	27.44 %	61.36 %	Saving in LE %

Table 6 Comparison between the different assumptions

One of the case study objectives is to evaluate the relation between the power consumption and the saving. Thus Correlation statistical method is suggested for calculation. A correlation coefficient is a single

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Encryption Protocol for Securing MANET-L to S

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Abstract— **Mobile ad hoc network are a kind of wireless ad hoc network that usually has a routable networking environment on top of a link layer ad hoc network. The technological growth in the field of wireless technologies provides communication between mobile users. Any invention is to say success, only if it is useful in a meaningful manner. Wireless technology is the one that will help an emergency needy like in any natural disaster, emergency rescue operations, military battle-field etc. With the advent of Mobile Ad-Hoc Networks, an immediate self-configuring network can be created. Being an open network, security is the main concern for MANETs. In such situations to protect the confidentiality of the message to be transmitted, cryptography is the one of the solution. The process of converting the original data into a secret form is known as cryptography. It hides the actual information and sends the encrypted message. At the destination end, the message can be recovered by using decryption. Here we are proposing a new encryption technique named as Letter-Shape Encryption. This method exchanges different shapes for letters in a message to be transmitted. This approach is safe against man in middle attacks.**

Keywords— **MANET, Encryption, Decryption, RSA algorithm, Key distribution, man-in-middle attacks.**

I. INTRODUCTION

The Present day information technology is mainly based on wireless technology [1],[2],[3]. With the advent of wireless networks we can exchange information between anybody located at any distance. Because of fixed infrastructure need of a conventional communication networks makes its use to be limited. If so, to help an emergency needy like natural disaster help, it is not possible to establish a communication network within hours. As a solution mobile ad hoc networks were invented. MANETs are the self-configuring networks, which forms a temporary network by requesting help from neighboring mobile nodes. MANETs plays a vital role in the field of wireless networks [4]. MANETs does not rely on any central control. Here communication can be initiated by any node in the network. i.e., any node can acts as source or destination. Node which wants to start communication will transmits a request of route to the next nearby nodes by mentioning the destination node address. If an intermediate node has a path to the receiver, a route reply will be sent back to the source node. Base on the short metric, source will selects the communication path towards receiver.

MANETs proposes many advantages like dynamic topology, self- configuring, self-organizing, and any node can initiate communication, no central administration, no need of infrastructure, can be set up anywhere. Since every invention has merits and demerits too. MANETs are basically wireless networks; there should be a prescribed security mechanism to protect the privacy of the data. Lack of central administration fails in detection and prevention attacks. MANETs also have few limitations. Energy constraints, limited security, topological changes, multiuser interference, limited bandwidth and power limitation become relevant issues.

Since in MANET, communication is achieved with the help of neighboring mobile nodes, the nodes have to cooperate with each other for the operation of the network. But sometimes nodes may refuse to cooperate in the form of dropping the packets. Ensuring security in MANET is a difficult issue. Moreover, in military environment preservation of security is a very serious issue. MANETs found its useful application military tactical communication. So far done researches proposed many algorithms rely on providing security for routing protocols, key management, and trust in MANETs; most of it is associated with cryptography, providing digital signature, certification etc.

Fig.1 shows the general principle of cryptography. The message to be encrypted is given as input and it is termed as plain text. Encryption algorithm converts plain text into a secret form using a key. This converted form of plain text is known as cipher text. Cipher text is allowed for transmission through the network. At the destination end cipher text is decrypted by using the decryption algorithm with the same key to get back the plain text

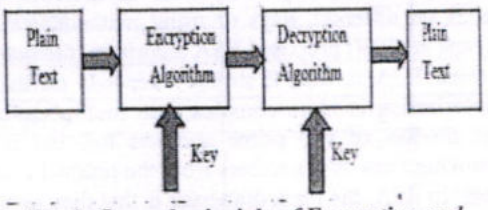

Fig 1. General principle of Encryption and Decryption process

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E-Bin for Waste Segregation

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Abstract— **An E-BIN is a cheap, easy to use solution for a segregation system at households, so that it can be sent directly for processing. It is designed to sort the refuse into metallic waste, wet waste and dry waste. This employs parallel resonant impedance sensing mechanism to identify metallic items, and capacitive sensors to distinguish between wet and dry waste. Experimental results show that the segregation of waste into metallic, wet and dry waste has been successfully implemented using the E-BIN. In recent times, garbage disposal has become a huge cause for concern in the world. A voluminous amount of waste that is generated is disposed by means which have an adverse effect on the environment. . In India, rag pickers play an important role in the recycling of urban solid waste. Dependency on the rag-pickers can be diminished if segregation takes place at the source level. Currently there is no system of segregation of dry, wet and metallic wastes at a household level. The purpose of this project is the realization of a compact, low cost and user friendly segregation system for urban households to streamline the waste management process.**

Keywords---**Sensor, Microprocessor, Motor.**

I. INTRODUCTION

In recent times, garbage disposal has become a huge cause for concern in the world. A voluminous amount of waste that is generated is disposed by means which have an adverse effect on the environment. The common method of disposal of the waste is by unplanned and uncontrolled open dumping at the landfill sites. This method is injurious to human health, plant and animal life .This harmful method of waste disposal can generate liquid leachate which contaminate surface and ground waters can harbor disease vectors which spread harmful diseases and can degrade aesthetic value of the natural environment and it is an unavailing use of land resources.

In India, rag pickers play an important role in the recycling of urban solid waste. Rag pickers and conservancy staff have higher morbidity due to infections of skin, respiratory, gastrointestinal tract and multisystem allergic disorders, in addition to a high prevalence of bites of rodents, dogs and other vermin. Dependency on the rag-pickers can be diminished if segregation takes place at the source of municipal waste generation.The economic value of the waste generated is not realized unless it is recycled completely. Several advancements in technology has also allowed the refuse to be processed into useful entities such as Waste to Energy, where the waste can be used to generate synthetic gas (syngas) made up of carbon monoxide and hydrogen. The gas is then burnt to produce electricity and steam, Waste to Fuel, where the waste can be utilized to generate bio fuels.When the waste is segregated into basic streams such as wet, dry and metallic, the waste has a higher potential of recovery, and consequently, recycled and reused. The wet waste fraction is often converted either into compost or methane-gas or both. Compost can replace demand for chemical fertilizers, and biogas can be used as a source of energy. The metallic waste could be reused or recycled.

Even though there are large scale industrial waste segregators present, it is always much better to segregate the waste at the source itself. The benefits of doing so are that a higher quality of the material is retained for recycling which means that more value could be recovered from the waste. The occupational hazard for waste workers is reduced. Also, the segregated waste could be directly sent to the recycling and processing plant instead of sending it to the segregation plant then to the recycling plant. Currently there is no system of segregation of dry, wet and metallic wastes at a household level. J.S. Bajaj has recommended that a least cost, most appropriate technological option for safe management should be developed. The purpose of this project is the realization of a compact, low cost and user friendly segregation system for urban households to streamline the waste management process. We are implementing a smart dustbin which is a cheap, easy to use solution for a segregation system at households, so that it can be sent directly for processing. It is designed to sort the refuse into metallic waste, wet waste and dry waste. The mixed waste is sorted based on the following methods at the industrial level. Larger items are removed by manual sorting. Then the refuse is sorted based on its size by using large rotating drums which is perforated with holes of a certain size. Materials smaller than the diameter of the holes will be able to drop through, but larger particles will remain in the drum. For metallic objects electromagnets or eddy current based separators can be used. Near infrared scanners are used to differentiate between various types of plastics based on the ability of the material to reflect light. X-rays

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can also be used to segregate materials based on their density.

II. PROBLEM STATEMENT

The main sources of waste are industrial and domestic waste. This project mainly concentrated on domestic waste whose value is unrecognized since people don't spend time on segregating waste into their basic streams. The wet waste generated can be used to generate biogas, metallic and dry waste can be send for recycling, if metallic waste is left untreated then it becomes a threat to animal and plant lives. If waste is separated at household level then they can be directly sent for recycling instead of sending them to industries first for segregation which becomes a huge task and the waste does not get segregated accurately. The methods adopted for waste segregation in industries is hazardous to human health since it makes use of x-rays and infrared rays

III. HARDWARE REQUIREMENT

- Microcontroller (AT89S52)
- IR sensors
- Moisture sensor
- Metal(Proximity) sensor
- DC Motor
- Stepper motor
- DC Motor driver
- Stepper motor driver
- Conveyor belt
- LCD
- Buzzer

VI. SOFTWARE REQUIREMENT

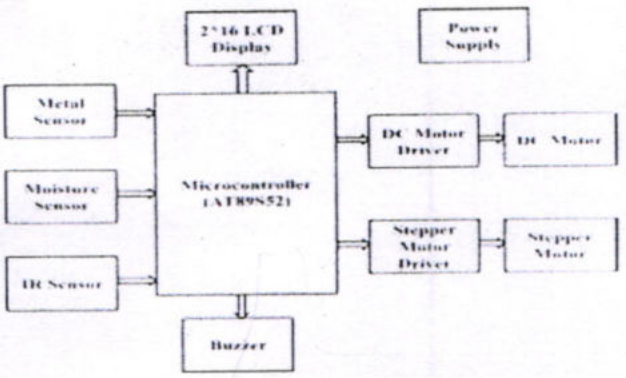
- Keil -µVision 3
- Embedded C
- TopWin

V. PROPOSED SYSTEM

The authors have made a quantitative analysis between existing dustbins and their serving population. The study first analyses the spatial distribution of dustbins in some areas of Dhaka city using average nearest neighbor functions of GIS. Remarkably, the spatial circulation of the current dustbins has appeared to be dominatingly in clustered pattern. Next, an optimal number of additional dustbins were calculated. It is shown that the number of existing dustbins is insufficient in the study area. The extent of pollution caused by the existing dustbins was calculated using spatial analyst functions of GIS. It is found that all the dustbins are burnt with wastes and causing pollution to the environment. The results thus obtained would help to understand the present situation of the waste management of Research Article Volume 6 Issue No. 6 International Journal of Engineering Science and Computing, June 2016 7114 http://ijesc.org/ Dhaka city and to optimally place the required number of dustbins to prevent further pollution to environment. The authors in have equipped the smart bins with ultrasonic sensors which measure the level of dustbin being filled up. The container is divided into three levels of garbage being collected in it. Every time the garbage crosses a level the sensors receives the data of the filled level. This data is further sent to the garbage analyzer as instant message using GSM module. Placing three ultrasonic sensors at three different levels of the container may be a disadvantage as the cost of the dustbin increases due to the sensors and also the sensors can be implemented.

VI. BLOCK DIAGRAM

Segregating waste



VII. CONCLUSION

Be wise Using "E- BIN". Waste Segregation using smart dustbin has been successfully implemented for the segregation of waste into metallic, dry and wet waste at root source.One of several environmental problems is bad waste management practices which can result in land and air pollution and can cause respiratory problems and other adverse health effects as contaminants are absorbed from the

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"Dustless Environment by Transportation Means"

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Abstract— **This is an automated system which will be fitted in the Bus for cleaning the dust particle from environment.The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. In this system Microcontroller is the main unit, which controls the whole process. We are going to use AVR family microcontroller (ATMEGA 8/ ATMEGA 16). Vacuum Cleaner is used for cleaning the dust particle from road, which is connected with microcontroller. There is a container for containing the dust particle. We are going to use IR sensor for detecting the quantity of dust particle in container. IR sensor will be fitted on the top of container. When the container will be filled with dust container, then the sensor will detect it and send information to microcontroller. The sensor will be connected with Microcontroller .There will be one alert system for giving alert when the sensor will detect the quantity of dust. There will be one manual switch, which will be used for opening and closing of the container. Motors will be fitted on the top of container for opening and closing container.solar panels are placed on roof of the bus for power supply**

Keywords:-. **Manual Switch. Microcontroller. Container.**

I. INTRODUCTION

The proposal aims at designing a unique system which can be controlled automatically for cleaning dust particle from road by using microcontroller, Vacuum cleaner and sensors. This proposal use to automatically clean of dust particle from road public means, where vacuum cleaner is present for sucking the dust particle from road and store it on a container. When Container will be filled, then the system will give alert. There will be one switch on the system for opening and closing the container. The system is automatedprocess, which is controlled by microcontroller unit. Sensors are used for detecting and vacuum cleaner is used for sucking the dust particle. The proposed technique is intended to facilitate the user to clean the dust particle through vacuum cleaner. We are using AVR family microcontroller (ATMEGA8/ATMEGA16), which controls the whole unit. To detect the quantity of container the IR sensor plays a major role. IR sensor is connected to microcontroller in order to send the alert signal Motor is fixed on the side of the container which helps it to open and close. Vacuum cleaner is an existing product.

II. LITERATURE SURVEY

According to the survey of 2015-2016, the number of peoples travelling in public means is around 50 lakh in Bengaluru city. For instance ,BMTC busses not only serves as public transport,but also provides its exclusive services to other organizations like IT companies ,Educational institutions,IT Tech parks,etc. Hence high percentage of people are dependent on BMTC.

III. EXISTING SYSTEM

1. Vacuum Cleaner.

A vacuum cleaner, also known as a sweeper, is a device that uses an air pump (a centrifugal fan in all but some of the very oldest models), to create a partial vacuum to suck up dust and dirt, usually from floors, and from other surfaces such as upholstery and draperies.

2.GPS tracking system.

A GPS tracking unit is a device, normally carried by a moving vehicle or person, that uses the Global Positioning System to determine and track its precise location.There are two types of GPS tracker system, car tracking system the data pullers and data pushers. The way these things operate are different but the end result is similar, you come to know where your car had been and where did it stop for how long, what direction it took and how fast it drove, all the data from these car tracking system in India, GPS tracker systems in India like Delhi, Mumbai, Jaipur, Chennai, Bangalore and many more.

IV. PROPOSED SYSTEM

The system is designed for four wheeled Vehicles. The system is Fixed – Adjacent to the energy storage system. For power consumption we use solar battery.IR sensor isfitted on top of the container which senses and give signal to driver. The driver will dump the garbage in particular area. By this process we can keep the city roads clean. So 30% of our city can be kept clean. Even in rainy season ,the sensor fixed in the container detects the wet particles. It sucks the both dry and wet particles. Using

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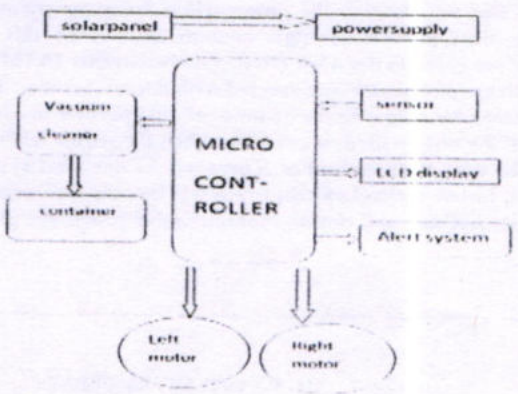
thekinetic energyproduced by the vehicles energy can be generated and used for vacuum cleaner instead of using stored energy .

V.BLOCK DIAGRAM



VI. WORKING PRINCIPLE

Our proposed system consists of micro controller which controls the whole process. The system will be fitted on bus, where vacuum cleaner is present for sucking the dust particles from road sides and store it on a container. When container is filled, then the system will give alert signal to driver there will be one switch near to the driver for opening and closing the container. The system is an automated process, sensors are used for detecting and vacuum cleaner is used for sucking the dust particles. Here we use microcontroller-ATMEGA8/ATMEGA16, IR sensor,vacuum cleaner,beeper,power supply,flash programmer as hardware requirements and AVR studio, embedded C, MATLAB, sinaprog as software requirementsAVR studio is the platform where we will write the code and compile the code for validation.Sinaprog is the platform in which we will jump our code from PC to microcontroller

6.1 COMPONENTS REQUIRED

Fixed resistor-Resistor is a passive component used to control current in a circuit. Its resistance is given by the ratio of voltage applied across its terminals to the current passing through it. Thus a particular value of resistor, for fixed voltage, limits the current through it. They are omnipresent in electronic circuits.The different value of resistances are used to limit the currents or get the desired voltage drop according to the current-voltage rating of the device to be connected in the circuit. For example, if an LED of rating 2.3V and 6mA is to be connected with a supply of 5V, a voltage drop of 2.7V (5V-2.3V) and limiting current of 6mA is required. This can be achieved by providing a resistor of 450 connected in series with the LED.

Resistors can be either fixed or variable. The low power resistors are comparatively smaller in size than high power resistors. The resistance of a resistor can be estimated by their color codes or can be measured by a multimeter. There are some non linear resistors also whose resistance changes with temperature or light. Negative temperature coefficient (NTC), positive temperature coefficient (PTC) and light dependent resistor are some such resistors. These special resistors are commonly used as sensors.

Capacitor- A capacitor is a passive two terminal electrical component used to store energy in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors separated by a dielectric (insulator); for example, one common construction consists of metal foils separated by a thin layer of insulating film. Capacitors are widely used as parts of electrical circuits in many common electrical devices.When there is a potential difference (voltage) across the conductors, a static electric field develops across the dielectric, causing positive charge to collect on one plate and negative charge on the other plate. Energy is stored in the electrostatic field. An ideal capacitor is characterized by a single constant value, capacitance, measured in farads. This is the ratio of the electric charge on each conductor to the potential difference between them.The capacitance is greatest when there is a narrow separation between large areas of conductor, hence capacitor conductors are often called "plates," referring to an early means of construction. In practice, the dielectric between the plates passes a small amount ofleakage current and also has an electric field strength limit, resulting in a breakdown voltage.

Transistor -When we talk of transistor in robotics, we talk about the cut off andsaturation region only, while in your course you study transistor in activeregion. So here I am talking about transistor as a switch. When we saytransistor as a switch, we talk of cut off or not because the typical cut off

Voltage is around 5V and the saturation voltage (vbe) is around 8V. Thereare regions between them. Let's start with transistor to glow an LED. Connect this circuit and see. Connect multimeter at the base of the transistorand see the voltage. In this circuit we can see that Ve=Vbe. For the

transistor to be switched ON Ve=.5V. Vary the potentiometer to makeVbe=.5V, you can see that LED starts glowing(but it is less brightness).Vary the potentiometer to make Vbe to around .8V , you can see that theLED brightness increases. This is because when Vbe=.5V it starts with cut

off and when Vbe=.7V in active and Vbe=.8V it become saturation region.Transistor is a current controlled device. In active region Ic=hfeIb and insaturation region Ic>hfeIb. That is why the brightness of the LED changes.

VII. ADVANTAGES

It creates Eco friendly environment. Automation system for cleaning of road(no human effort for cleaning road). Less cost for cleaning city than manual human effort. .City can be kept clean.

VIII. FUTURE ENHANCEMENT

Separation of dry and wet particles which is in the container. The trash collected wet particles can be recycled and used for agriculture.Smart dustbin can be used.

IX. CONCLUSION

It is impossible to clean the city roads. Cleanliness can be done by transportation means. The project is aimed to design and implement to where less manual power is used for cleaning city which is an automatically cleaned by Buses, it important for facility heads to primarily understands the need for professional cleaning equipment as an essential pre-request for better work environment so one of the most common equipment used for commercial application in any premises is the vacuum cleaner, ecofriendly Environment, automation system for cleaning of road ,less Cost for cleaning city than manual human efforts.

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Spruceness In City Roads

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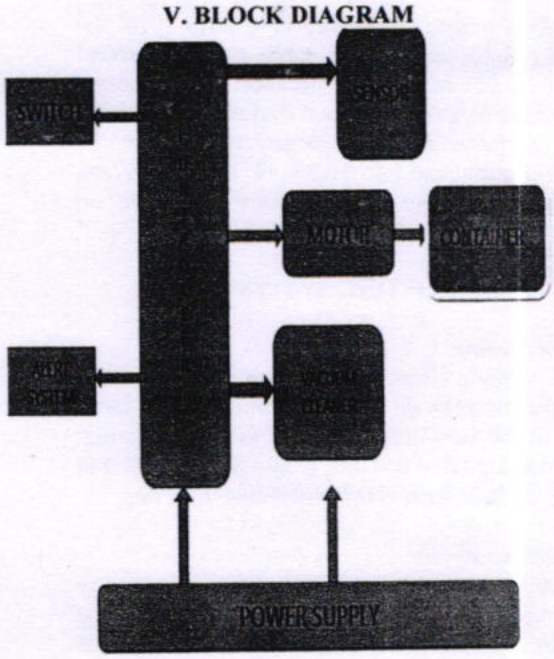

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Digital Forensics,Cyber Crime and Datamining

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Abstract: -- **The world has evolved from using one's brain to cloning one's brain. A person is not assured whether the data with him is safe or leaked.People have moved on in their formal and informal behavior to being digitalized.Profits and loss in the commercial markets today are decided in matters of software. Hacking and electronic crimes sophistication has grown at an exponential rate in recent years. In fact, recent reports have indicated that cyber crime already surpasses the illegal drug trade!Source code theft, Online banking frauds, Online share trading fraud,Virus attacks, Cyber sabotage, Phishing attacks, E-mail hijacking are the most common threats in the cyber world today.In this paper we are discussing about the how factor of cyber crime and analyzing the methods to retrieve data, tools to find the culprit.The detailed process of detecting hacking attacks and properly extracting evidence to report the crime and conduct audits to prevent future attacks is also discussed**

Keywords: - **Software Architecture,Digital Forensic tools, Control design, Crime pattern detection**

I. INTRODUCTION

Analyzing, investigating and accumulating the digital evidence and cyber trails are better known as Cyber Crime Investigation. You'll fall across them in computer hard disks, cell phones, CDs, DVDs, floppies, computer networks, the internet etc. Digital evidence and cyber trails can be derived from pictures, (stangnography), encrypted files, password protected files, deleted files, formatted hard disks, deleted emails, chat transcripts etc., The technical nature of cyber crimes demands for a specialized discipline to investigate for such sophis-ticated crimes. The volatile nature of digital evidence further adds a layer of complexity to the entire process of cyber crime Cyber crime Cyber Law Consultancies. It is a dream shared and brought up by two computer geniuses to make the society upgraded and making them cognizant about the cyber crimes that curb the innocence of environment. Thus, commencing with a rebellion in favour of cyber security.

Computer forensics is the practice of collecting, analysing and reporting on digital data in a way that is legally admissible. It can be used in the detection and prevention of crime and in any dispute where evidence is stored digitally. Computer forensics follows a similar process to other forensic disciplines, and faces similar issues.

Computer forensics- the preservation, identification, extraction, interpretation, and documentation of computer evidence, to include the rules of evidence, legal processes, integrity of evidence, factual reporting of the information found, and providing expert opinion in a court of law or other legal and/or administrative proceeding as to what was found.

Cyber crime- any illegal act that involves a computer, its systems, or its applications. Forensic investigator- an investigator who helps organizations and law enforcement agencies in investigating cyber crimes and prosecuting the perpetrators of those crimes.

Data mining is part of the interdisciplinary field of knowledge discovery in databases. Research on data mining began in the 1980s and grew rapidly in the 1990s.Specific techniques that have been developed within disciplines such as artificial intelligence, machine learning and pattern recognition have been successfully employed in data mining. Data mining has been successfully introduced in many different fields. An important application area for data mining techniques is the World Wide Web Recently, data mining techniques have also being applied to the field of criminal forensics nothing but Digital forensics. Examples include detecting deceptive criminal identities, identifying groups of criminals who are engaging in various illegal activities and many more. Data mining techniques

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typically aim to produce insight from large volumes of data.

II. FILE SYSTEM FORENSICS

The File system investigation is the identification, collection and analysis of the evidence from the storage media. File systems or file management systems is a part of operating system which organize and locate sectors for file Storage. File systems are classified into the following four categories:

- Disk file system: A disk file system is used for stor-ing and recovering the files on a storage device, such as a hard disk, that is directly or indirectly connected to a computer. A few examples of disk file systems are FAT16, FAT32, NTFS, ext2, ISO 9660, ODS-5, and UDF.

- Network file system: A network file system is a type of file system that provides access to files on other computers on a network. The file system is transparent to the user. A few examples of network file systems are NFS, CIFS, and GFS

- Database file system: Earlier file systems use a hie-rarchical management structure, but in the database file system, files are identified by their characteristics, like the name, type, topic, and author of the file, or similar metadata. Therefore, a file can be easily searched using SQL queries or text searches. For example, if a user needs to find the documents written by ABC, then the search string "documents written by ABC" will show the results.

- Special purpose file system: A special purpose file system is a file system where the files are organized by software during runtime. This type of file system is used for various purposes, such as communication between computer processes or temporary file space. Special purpose file systems are used by filecentric operating systems such as UNIX. One example in UNIX is the /proc file system, which can beused to access information about processes and other operating system features.

III. HARD DISKS

Data is organized on a hard disk in a method similar to that of a filing cabinet. The user can easily access the data and programs. When a computer uses a program or data, the program or data is copied from its location to a temporary location. When a user makes changes to a file, the computer saves the file by replacing the older file with the new file.journal, so please be sure to refer to the correct journal when seeking information.

Lost Clusters A lost cluster is a FAT file system error that results from how the FAT file system allocates space and chains files together. It is mainly the result of a logical structure error and not a physical disk error.They usually occur because of interrupted file activities; thus, the clusters involved never get correctly linked to a file. Operating systems mark these clusters as being used in the FAT, even though they are not assigned to any file. Disk-checking programs can scan an entire disk volume for lost clusters. The programs can then either clear the lost clusters or save them as files. In the latter case, artificial files are generated and linked to these clusters. These newly formed files are considered damaged, but some orphaned data can be seen and recovered. Disk-checking programs, such as ScanDisk, can find lost clusters using the following procedure:

- Create a memory copy of the FAT, noting all of the clusters marked as being in use.

- Trace the clusters starting from the root directory, and mark each cluster used by a file as being accounted for. Continue through all of the directories on the disk.

- When the scanning process is finished, any clusters that are in use but not accounted for are orphans,or lost clusters.

clustering techniques. Our contribution here was to formulate crime pattern detection as machine learning task and to thereby use data mining to support police detectives in solving crimes. We identified the significant attributes; using expert based semi-supervised learning method and developed the scheme for weighting the significant attributes. Our modeling technique was able to identify the crime patterns from a large number of crimes making the job for crime detectives easier. Some of the limitations of our study includes that crime pattern analysis can only help the detective, not replace them. Also data mining is sensitive to quality of input data that may be inaccurate, have missing information, be data entry error prone etc. Also mapping real data to data mining attributes is not always an easy task and often requires skilled data miner and crime data analyst with good domain knowledge. They need to work closely with a detective in the initial phases. As a future extension of this study we will create models for predicting the crime hot-spots [3] that will help in the deployment of police at most likely places of crime for any given window of time, to allow most effective utilization of police resources. We also plan to look into developing social link networks to link criminals, suspects, gangs and study their interrelationships. Additionally the ability to search suspect description in regional, FBI databases, to traffic violation databases from different states etc. to aid the crime pattern detection or more specifically counter terrorsim measures will also add value to this crime detection paradigm.

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IV. HIDDEN EVIDENCE ANALYSIS IN THE FILE SYSTEM

Suspects can hide their sensitive data in various areas of the file system such as Volume slack; file slack, bad clusters, deleted file spaces [5].

1) Hard Disk: The maintenance track/Protected Area on ATA disks are used to hide information. The evidence collection tools can copy the above contents.

2) File System Tables: A file allocation table in FAT and Master File Table (MFT) in NTFS are used to keep track of files. Figure 2 shows MFT structure. MFT entries are manipulated to hide vital and sensitive information

3) File Deletion: When a file is deleted, the record of the file is removed from the table, thereby making it ap-pear that it does not exist anymore. The clusters used by the deleted file are marked as being free and can now be used to store other data. However, although the record is gone, the data may still reside in the clusters of the hard disk. That data we can recover by calculate starting and end of the file in Hex format and copy it into a text file and save with corresponding extension.

Recover a JPEG file

a) Open file in the hex format.
b) Check the file signature.
c) Copy From starting signature upto ending signature.
d) For example (JPEG/JPG/JPE/JFIF file starting signa-ture is FF D8 FF E1 XX XX 45 78 69 66 00 (EXIF in ascii Exchangeable image file format trailer is FF D9). Figure 2. MFT structure.
e) Open the file with corresponding application.

4) Partition Tables: Information about how partitions are set up on a machine is stored in a partition table, which is a part of the Master Boot Record (MBR). When the computer is booted, the partition table allows the computer to understand how the hard disk is organized and then passes this information to the operating system. When a partition is deleted, the entry in the partition table is removed, making the data inaccessible. However, even though the partition entry has been removed, the data still resides on the hard disk.

5) Slack Space: A file system may not use an entire partition. The space after the end of the volume called volume slack that can be used to hide data. The space between Partitions is also vulnerable for hiding data, file slack space is another hidden storage. Figure 3 shows slack spaces in a Disk. When a file does not end on a sector boundary, operating systems prior to Windows 95 a fill the rest of the sector with data from RAM, giving it the name RAM slack. When a file is deleted, its entry in the file system is updated to indicate its deleted status and the clusters that were previously allocated to storing are unallocated and can be reused to store a new file. However, the data are left on the disk and it is often possible to retrieve a file immediately after it has been deleted. The data will re-main on the disk until a new file overwrites them however, if the new file does not take up the entire cluster, a portion of the old file might remain in the slack space. In this case, a portion of a file can be retrieved long after it has been deleted and partially overwritten.

6) Free Space: However, when a file is moved from one hard disk or partition to another, it is actually a multistep process of copying and deleting the file. First, a new copy of the file is created on the target partition. After the file has been copied, the original file is then deleted. This process also requires some housekeeping in the FAT or MFT tables. A new entry is created in the table on the partition where it has been copied, whereas the record for the deleted file is removed from the table on its partition. When a file get deleted, that space consi-dered as free space, there also criminal can hide sensitive information.It is crucial since the content is not recreated, but rather converted into the final published version.

V. DATA MINING AND CRIME PATTERNS

We will look at how to convert crime information into a data-mining problem , such that it can help the detectives in solving crimes faster. We have seen that in crime terminology a cluster is a group of crimes in a geographical region or a hot spot of crime. Whereas, in data mining terminology a cluster is group of similar data points – a possible crime pattern. Thus

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appropriate clusters or a subset of the cluster will have a one-to-one correspondence to crime patterns. Thus clustering algorithms in data mining are equivalent to the task of identifying groups of records that are similar between themselves but different from the rest of the data. In our case some of these clusters will useful for identifying a crime spree committed by one or same group of suspects. Given this information, the next challenge is to find the variables providing the best clustering. These clusters will then be presented to the detectives to drill down using their domain expertise. The automated detection of crime patterns, allows the detectives to focus on crime sprees first and solving one of these crimes results in solving the whole "spree" or in some cases if the groups of incidents are suspected to be one spree, the complete evidence can be built from the different bits of information from each of the crime incidents. For instance, one crime site reveals that suspect has black hair, the next incident/witness re-veals that suspect is middle aged and third one reveals there is tattoo on left arm, all together it will give a much more complete picture than any one of those alone. Without a suspected crime pattern, the detective is less likely to build the complete picture from bits of information from different crime incidents. Today most of it is manually done with the help of multiple spreadsheet reports that the detectives usually get from the computer data analysts and their own crime logs. We choose to use clustering technique over any supervised technique such as classification, since crimes vary in nature widely and crime database often contains several unsolved crimes. Therefore, classification technique that will rely on the existing and known solved crimes, will not give good predictive quality for future crimes. Also nature of crimes change over time, such as Internet based cyber crimes or crimes using cell-phones were uncommon not too long ago. Thus, in order to be able to detect newer and unknown patterns in future, clustering techniques work better

VI. DIGITAL FORENSIC TOOLS

Restricted Access Tools

Users can access the following tools after they register and are vetted. Live View LE allows forensic investigators to take a physical device or an image file of a disk or partition and automatically transform it into a virtual machine. CCFinder is a suite of utilities designed to facilitate the discovery, organization, and query of financial data and related personally identifiable information in large-scale investigations. CryptHunter alerts law enforcement if active encryp-tion is running on a system so that investigators can act to preserve evidence that would be lost if the system were shut down.

ADIA is a VMware-based appliance used for digital investigation and acquisition. Unrestricted Access Tools Users can access the following tools for free; no secondary access is required. AfterLife permits the collection of physical memory contents from a system after a warm or cold reboot. Live View (public version) is a Java-based graphical forensics tool that creates a VMware virtual machine out of a raw (dd-style) disk image or physical disk.

DINO is a lightweight front end for network visualization and utilizes the open source network monitoring tools SiLK and SNORT to create an easy-to-use dashboard for situational awareness.

LATK is a collection of command line and web-based tools for use in incident response and long-term analysis of web server and proxy server log data. CERT Linux Forensics Tools Repository houses pack-ages for Linux distributions. The repository provides useful tools for cyber forensics acquisition and analysis practitioners and is currently offering Fedora and Cen-tos/RHEL.

Information Only

Users can access information and perhaps more about the following tools; requests are handled on a case-by-case basis.

C-CAP is a state-of-the-art forensics analysis environ-ment that provides a broad set of tools for host-based and network investigations. MCARTA is a completed incident analysis framework in respect to run-time analysis with automated log and pocket data correlation.

VII. CONCLUSIONS AND FUTURE DIRECTION

We looked at the use of data mining for identifying crime patterns crime pattern using the

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"Digibin"-a smart way of sorting solid waste

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Abstract— **Waste Management is the pervasive problem. Nowadays and rising continuously with rise in urbanization. Waste is always the mixture of different types of material. The main goal of this project is to design and develop a sorting system that is portable and also sorts the waste automatically. It's an eco-friendly automatic system. With the Proliferation of Internet of Things (IOT) Devices as Such as Smart phones and Sensors, this Project describes the effective management of solid waste using embedded system. The solar panel and H-bridge are used by the motor to make the system portable. The moving system stops when a non-living obstacle arrives and takes a turn. Otherwise gets the inputs from the waste dumped by the person which is detected by the sensor. The sensor sends a signal to micro-controller where it decides the type of waste (biodegradable and non-biodegradable) and separates it automatically and moves forward. Here the IOT module is used to control and monitor the waste. The system consist of mobile app which receives a message when the dustbin is full (3kg) makes the system to alert and the information is sent to the authority who own the and it resend the meesge to the bin for automatic disposal to the dump site. It even includes database of wastage collection on the particular day.**

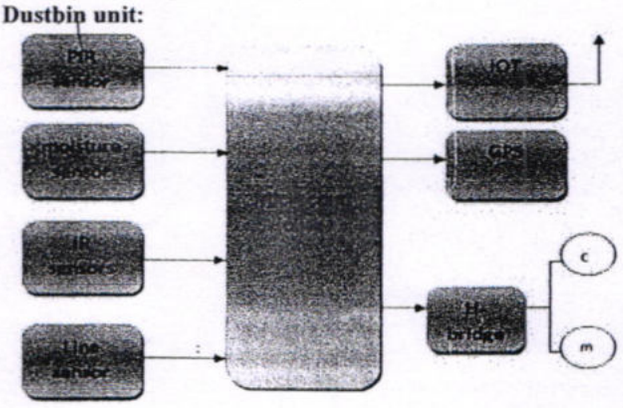
I. TECHNOLOGY: PART OF IOT IN THE PROJECT

The information or the database of the dustbin on a particular day is made enabled to people to look in into the android application called "Mr.Bin" and it also can be viewed by the Waste management organization. The IOT is also applicable to send signals(messages) through web-base software application when the dustbin is full.

II. INNOVATION PART OF THE PROJECT

Our project can be implemented for historical monuments and pilgrimages that may also includes tourist places such as parks ,gardens ,beaches etc .But specifically lets go with the monument places and pilgrimages.So,the installation of process includes a tech bin, sensor(IR sensor, metal detector sensor, weight sensor, obstacle sensor), IOT module to instruct bin facility, a lid for management of waste segregation ,a motor and solar panel for the portability of the tech bin, GPS to keep the track of the bin. System is provided with the solar panels and H-Bridge which makes the system to be in motion, an IR sensor is interfaced in front of a bin which detects the obstacle arrived and this alerts the system to stop. The sorting part of the system starts if the waste material is placed on the lid, then the sensor transmits the signal and that signal is received by the microcontroller, depending on the signal received the lid of the system works. If the signal is transmitted by the metal detector then the lid tilts towards the bin that collect the non-biodegradable waste. If the signal is transmitted by the IR sensor then the lid tilt towards the biodegradable bin. In case no signal is transmitted by the either sensor the waste may be plastic bottle, glass bottle or polythene bag, then the lid tilt towards the bin which collects the non-biodegradable waste. Another IR sensor is interfaced in front the bin which detects the obstacle if it is a person who is arrived to throw the waste it takes input and moves forward in chance that the obstacle may be a non-living thing, in that case the system will automatically take a turn. once the dustbin is filled 90% it sends the information (message) to a App the bin and resend the signal to the bin for automatic disposal hence forth the bin does not take any waste and directly go to dumpsite for waste disposal .The information or database of the dustbin on a particular day is also stored in android application and this monitored information can be also sent to a web-based software app which can also be viewed by municipal wastage community.

Dustbin unit:



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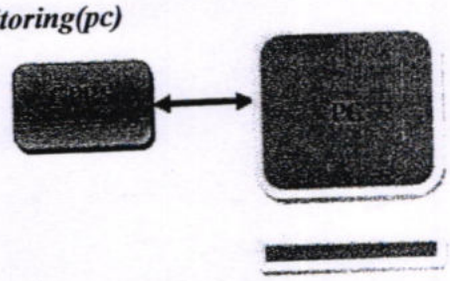
Monitoring(pc)



COMPONENTS USED

Hardware requirements:

- Microcontroller
- PIR sensor
- Moisture sensor
- IR sensor
- GPS
- GSM modem
- Driver circuit
- DC motor
- PC

Software requirements:

- Embedded C
- Kiel vision 4
- Dot net

III. EXISTING SYSTEM

The existing system only consists of seperation of solid waste (wet dry) in the bin which is static and can be used only for the household purpose. Garbage disposal is done manually in the existing system. There is no IOT monitoring is done for the bin.

Purposed system

Our paper talks about separation of three types of waste in the bin itself .it is a portable system can also be used in commercial areas, disposal of waste also automatically done by the bin itself through the monitoring of the IOT based android application .

Advantages

- **.Power generation using plastics:** The waste containing plastic is further used in the generation of power. The below figure shows power generation system using plastics.
- **.Making money from waste:** The waste which we separate can get us some amount of money but saves huge amount of money by providing us good health and health is wealth.
- **One of the steps for Swachh Bharat:** Swachh Bharat campaign was officially launched on 2 October 2014 at Rajghat, New Delhi, where Prime Minister Narendra Modi himself cleaned the road.

Disadvantages

- **Mixed waste cannot be separated:**

Using our Smart dustbin mixed waste cannot be separated.

- **Cannot be used for large waste:**

Our smart dustbin cannot be use for large size waste.

IV. CONCLUSION

Waste Segregation using Robotic dustbin has been successfully implemented for the segregation of waste into metallic, dry and wet waste at root source. So that we can have a clean and smart tourist places. One of several environmental problems is bad waste management practices which can result in land and air pollution and can cause respiratory problems and other adverse health effects as contaminants are absorbed from the lungs into other parts of the body. The method presented provides a fruitful way to come out of this problem by making entire system automated

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Design and Analysis of Modern Switching Sequence for Bus Clamping Technique used in Hybrid Power System with SVPWM Method

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ABSTRACT

In conventional space vector pulse width modulation (CSVPWM) technique, each conventional sequence in switching is designed with a couple of zero condition vectors and two active state vectors which is divided equally the zero condition vector time betwixt a couple of zero conditions in each subdivision of the cycle. Existing bus clamping pulse width modulation (BCPWM) techniques make use of switching clamping sequences which involves single zero switching condition in a subdivision of the revolving period. This proposal suggests a new type of switching clamping sequences, called as "novel double switching bus clamping sequences" and this switching clamping sequences use single zero condition vector and an active condition vector which are doing over again double in a subdivision of the revolving period. The proposed bus clamping pulse width modulation techniques decreases the inverter switching losses, harmonic content in current and increases DC bias utilization compared to CSVPWM and existing BCPWM techniques at better modulation index for a given identical usual standard frequency of switching. This paper investigates the design and analysis of new double switching bus clamping sequence used in hybrid power system with space vector method. In the present work, the switching losses in an inverter can be reduced at high power factors compared to CSVPWM and existing BCPWM techniques. Simulation is done on v/f controlled technique in MATLAB/SIMULINK.

KEY WORDS: Hybrid Power System, Power Sharing, Fuzzy Logic MPPT, Bus clamping PWM, PWM VSC, SVPWM, Double Switching Clamping Sequences.

1. INTRODUCTION

In today's industrial applications like VSI fed electrical drives and electronic power converters etc., the various types of PWM techniques used finds the DC bias utilization and strongly influences the quality of current waveforms and switching losses in an inverter. Voltage source based inverter fed electrical machines are mostly employed for variable speed applications in hybrid power system. The switching frequency can be within a certain specified range due to practical limitations. While switching frequency is given, the disturbance is reduced by a good design of PWM Technique. The proposed work investigates design and analysis of novel double switching bus clamping sequences for VSI. SPWM and CSVPWM are very simple and well known real time PWM techniques. CSVPWM and THIPWM lead to decrease in disturbance at HV side of the line for given DC bias voltage compare to SPWM. Discontinuous modulation methods go ahead to decrease in disturbance at HV side of the line compare to CSVPWM at same switching frequency. This proposed work introduces lofty performance HSVPWM, which further decrease the disturbance in line currents compare to real-time technique at a given usual standard frequency of switching.

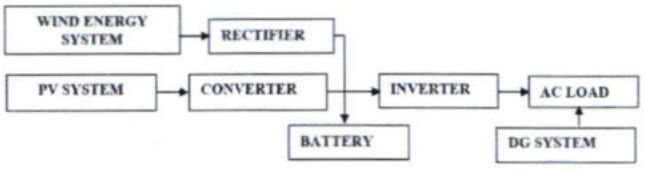


Figure.1. Schematic Block Diagram of Hybrid Power System

With SPWM, CSVPWM and THIPWM, each phase switches once in each subdivision of the revolving period or half carrier signal. This proposed work investigates the new sequence in switching techniques that switch 'a' phase switches double in a subdivision of the cycle, while second phase switches once and clamping the third phase. This proposed work carry out all such possible sequences (adding two new sequences), which effects identical usual standard frequency of switching as CSVPWM for a given specimen frequency. The proposed hybrid modern PWM techniques make use of sequence which effects in the lowest ripples presented in the rms value of current over a given sub cycle, out of given set of sequences. Consequently the entire ripple presented in the rms value of current over a fundamental cycle is diminished. The proposed system is feeding power to a local load as shown in Figure.1.

Switching Sequences of Inverter: A three-phase VSI is designed with eight switching state vectors shown in Figure.2. A couple of zero condition vectors (−−− and +++) produce a zero voltage magnitude vector. Six active state vectors produce six active voltage magnitude vectors. These active state vectors are placed in hexagonal pattern and angle among each state vector is 60°. The magnitudes of active state vectors are designed that they are satisfied the DC bias voltage.

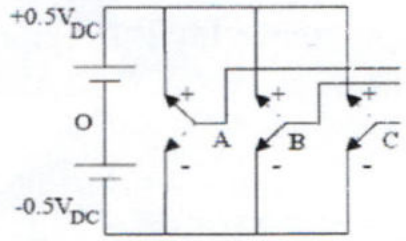


Figure.2. Three Phase Two level inverter Circuit diagram

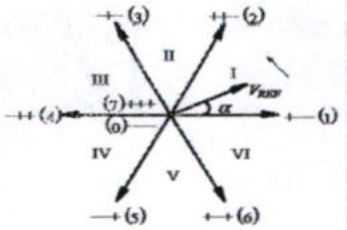


Figure.3. Inverter states and voltage vectors of Three phase Two level Inverter

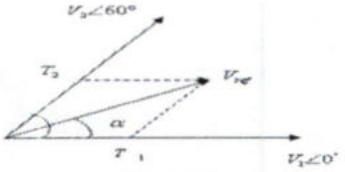
The six active space vectors are represented by the following expression:

$$\vec{V}_k = \frac{2}{3} V_d e^{j(k-1)\frac{\pi}{3}} with(k = 1,\cdots,6) \quad (1)$$

In SVPWM, the voltage allusion is sampled one time in each subdivision of the cycle, T_S. Given a specimen revolving reference vector magnitude V_{REF} and angle α in zone-I as exhibited in Figure.3, the time duration of active condition vector 1, active condition vector 2 and zero condition vector in the subdivision of the cycle are applied by T_1, T_2, and T_Z, respectively, in CSVPWM divides T_Z evenly betwixt 0 and 7, and make use of the sequence of switching 0127 or 7210 in a subdivision of the revolving period in zone-I.

The conditions to be satisfied by a valid switching sequence in Zone-I are as follows:

- The active conditions 1 and 2 should be given at minimum one time in a subdivision of the revolving period.
- Either the zero condition 0 or the zero condition 7 should be given at minimum one time in a subdivision of the revolving period.
- In case of manifold application of an active condition, the entire time period for which the active condition is given in a subdivision of the revolving period should fulfill (1).
- The entire time period for which the zero condition vectors either using the zero condition 0 or the zero condition 7 is given in a subdivision of the revolving period should fulfill (1).
- Only single stage should switch for a state transition.
- The entire digit of switching sequences in a subdivision of the revolving period should be less than or equal to 3. While giving sampling Frequency, the average frequency of switching should be less than or equal to that of CSVPWM.



From the Volt-time balance principle T_1, T_2 and Tz can be given as

$$T_1 = Vref * Ts * \frac{\sin(60^0 - \alpha)}{\sin 60^0}$$

$$T_2 = Vref * Ts * \frac{\sin(\alpha)}{\sin 60^0}$$

$$Tz = Ts - T_1 - T_2 \text{ ---------- (2)}$$

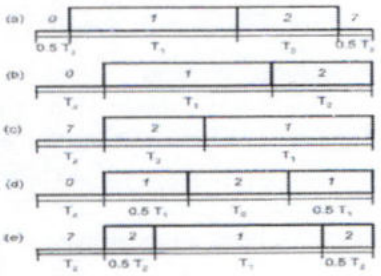


Figure.4. Different possible series of switching in zone-I

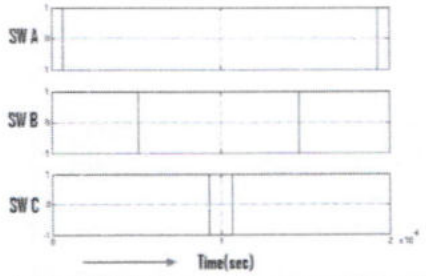


Figure.5. PWM Gate signals when the reference vector sitting in zone-I (0127)

Switching sequence 7212 show the way to R -phase clamping to the positive dc bus, while sequence 0121 effects in B-phase clamping to the negative dc bus. Both 7212 and 0121 switching sequences result in Y –phase clamping to make for switching double in a subdivision of the revolving period. Hence, switching sequences 0-1-2-1 and 7-2-1-2 are named double-switching bus clamping sequences here. Different possible series of switching in

Figure.4 are employed in zone-I. The series of switching in six sectors are as listed in Table 1. The gate signals of PWM for the CSVPWM is exposed in Figure.5.

Table.1. Sequences of switching in Six Sectors

Sector	Convectional sequence	Clamping sequences	Double-switching Clamping sequences
I	(0127, 7210)	(012, 210), (721, 127)	(0121. 1210), (7212, 2127)
II	(7230, 0327)	(723, 327), (032, 230)	(7232, 2327), (0323, 3230)
III	(0347, 7430)	(034, 430), (743, 347)	(0343, 3430), (7434, 4347)
IV	(7450, 0547)	(745, 547), (054, 450)	(7454, 4547), (0547, 5450)
V	(0567, 7650)	(056, 650), (765, 567)	(0565, 5650), (7656, 6567)
VI	(7610, 0167)	(761, 167), (016, 610)	(7616, 6167), (0161, 1610)

Modern PWM Techniques: The modern PWM technique is classified into two methods and those are: Continuous PWM (CPWM) Methods, Discontinuous PWM (DPWM) Methods.

In discontinuous PWM methods, modulation signal per stage contains one smallest amount of separated portion which is clamped to the +ve or -ve DC bus for at most a total of 120° (over a fundamental cycle). Where as in continuous PWM method, clamping is not occurred in the modulation wave.

$$Min = \frac{2V_{in}}{V_{dc}} + (1-2\mu) - \frac{2\mu\, V_{min}}{V_{dc}} + \frac{2(\mu-1)\, V_{max}}{V_{dc}}; \; i = a, b, c \quad \text{-------} \quad (3)$$

The selection of μ gives rise to an innumerable quantity of PWM modulations. To obtain the generalized discontinuous modulation signal, μ is given as:

$$\mu = 1 - 0.5[1+\text{sgn}(\cos 3(\omega t + \delta))] \quad \text{----------} \quad (4)$$

When μ = 0, out of three phases any one phase is clamped to +ve dc bias for 120° and then DPWMMAX is obtained. When μ = 1, any one of the phases is clamped to negative dc bias for 120° and then DPWMMIN is obtained. If μ = 0.5, then the space vector PWM technique is obtained. In a similar way, the difference in modulation phase angle δ is produced to innumerable quantity of DPWM methods. If δ = 0, -pi/6, -pi/3, then DPWM1, DPWM2 and DPWM3 is obtained respectively. The modulation signals of the different PWM methods are exposed in Figure.6.

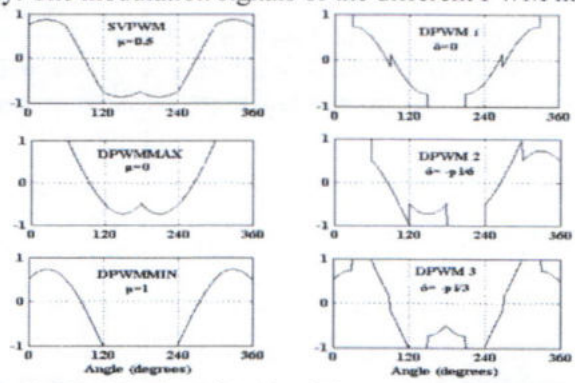


Figure.6. Modulation signals of the various PWM Methods

The CSVPWM techniques make use of same separation of zero voltage vector periods inside a specimen period or sub cycle. Nevertheless, different DPWM techniques can be produced while the independence of zero condition time separation is utilized. GDPWM algorithm is employed for consumption of the independence of zero condition time separation. In this proposed method the zero condition time will be shared between a couple of zero conditions as T_0 for V_0 and T_7 for V_7 respectively, and T_0, T_7 can be expressed as:

$$T_0 = T_z\mu$$
$$T_7 = T_{z(1-\mu)} \quad \text{----------} \quad (5)$$

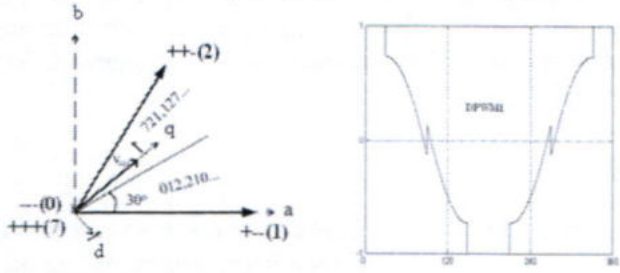


Figure.7. Existing Bus-Clamping PWM Technique (30° Clamp)

Bus-Clamping PWM Techniques: A popular existing bus-clamping method clamps every phase during the central point of 30° period in each fourth part of the revolving period of its fundamental voltage. This technique, termed as

30° clamp. This makes use of series 721, 127, in the first half, and 012, 210, in the next half of zone-I as shown in Figure.7.

In Figure.8(a), each stage is clamped continually for 60° period in each half revolving period of the basic voltage waveform. Such types of techniques are termed continual clamping techniques. In Figure.8(b), the 60° clamping duration is separated into one interval of width in the first quarter cycle and another interval of (60° -γ) in the next quarter in every half cycle. Since the clamping duration is separated into a couple of intervals, these techniques are termed split clamping PWM techniques. Figure.9(a) and 9(b) present the mean of a number of values of pole voltage waveforms that illustrate a couple of types of clamping for γ= 45°.

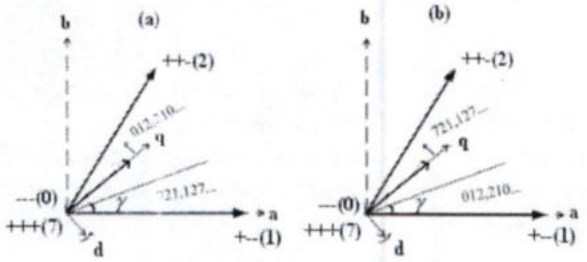


Figure.8. Existing bus-clamping PWM techniques (a) Continual clamping (b) Split clamping

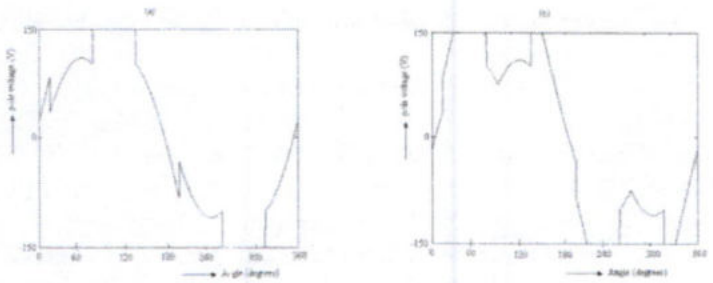


Figure.9. Average Pole Voltage over a fundamental cycle for VREF = 0.75 corresponding to (a) Continual clamping and (b) Split clamping both with γ=45o

The design of the phase voltage of the inverter and common mode voltages for different pulse sequences are:

$$V_{an} = \frac{V_{dc}}{6}(2S_a - S_b - S_c)$$

$$V_{bn} = \frac{V_{dc}}{6}(2S_b - S_c - S_a) \qquad \text{.....(6)}$$

$$V_{cn} = \frac{V_{dc}}{6}(2S_c - S_a - S_b)$$

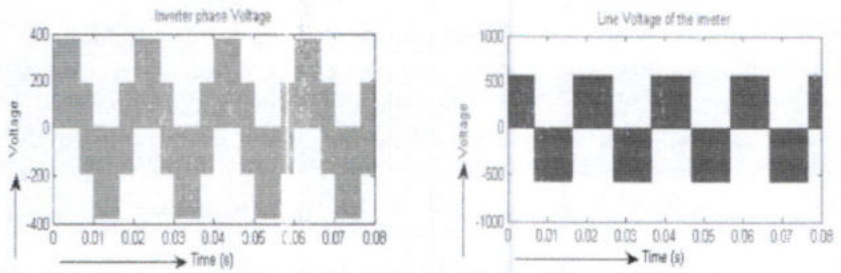


Figure.10. Simulated Phase and Line Voltages Waveforms of the Inverter

Volts/Hz Control Technique: This is an effective method of Speed Control because of simplicity. The Flux and Torque are also function of frequency and voltage respectively the greatness difference in control variables only. The air gap voltage of motor is; $E_{ag} = \mathrm{K}\ f\ \phi_{ag}$

$$\phi_{ag} = Cons\tan t = \frac{E_{ag}}{f} \approx \frac{V}{f}$$

Speed can be controlled by changing the frequency and maintain constant voltage-frequency ratio to shun saturation of flux. With constant v/f ratio, motor develops a invariable highest torque.

Analysis of Switching Techniques:

Analysis of Existing BCPWM Algorithms: Sequence 012 leads to less ripple presented in RMS value of current over a subdivision of the revolving period than 721 in the first half of the sector, and vice versa in the next half of the sector.

$$F_{012}(\alpha) < F_{721}(\alpha),\ 0^\circ < \alpha < 30^\circ \text{ -------- (6a)}$$

$$F_{012}(\alpha) > F_{721}(\alpha),\ 30^\circ < \alpha < 60^\circ \text{ -------- (6b)}$$

$$F_{012}(\alpha) = F_{721}(60^\circ - \alpha) \text{ -------- (7)}$$

Table.2. Measured Values of I_{THD} for Existing BCPWM

No Load Current THD	γ=30°	γ =45°
Continual Clamping	5.32%	4.72%
Split Clamping	4.61%	5.01%

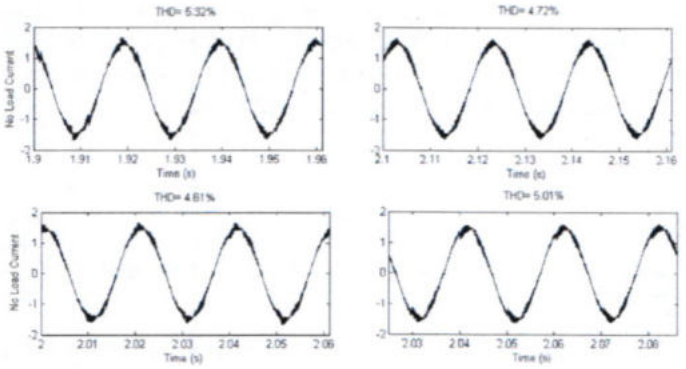


Figure.10. Measured No-Load Current Waveforms at V_{REF}=0.85 for Existing BCPWM Techniques

Analysis of Proposed BCPWM Algorithms:

$$F_{0121}(\alpha) < F_{7212}(\alpha),\ 0^\circ < \alpha < 30^\circ \text{ -------- (8a)}$$

$$F_{0121}(\alpha) > F_{7212}(\alpha),\ 30^\circ < \alpha < 60^\circ \text{ -------- (8b)}$$

$$F_{0121}(\alpha) = F_{7212}(60^\circ - \alpha) \text{ -------- (9)}$$

Table.3. Measured Values of I_{THD} for Proposed BCPWM

No Load Current THD	γ=30°	γ =45°
Continual Clamping	3.91%	3.46%
Split Clamping	2.66%	3.04%

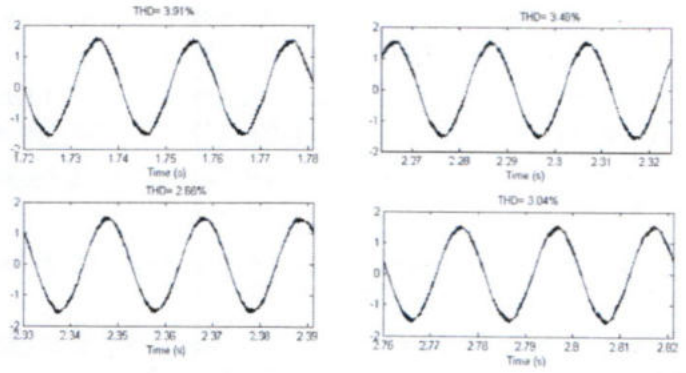


Figure.11. Measured No-Load Current Waveforms at V_{REF}=0.85 for Proposed BCPWM Techniques

Inverter Switching Losses: This section presents a comparison of switching losses in an inverter due to CSVPWM and existing BCPWM algorithms. The switching energy loss in a subdivision of the revolving period in an inverter leg is proportional to the phase current and the switchings numeral of the phase (n) in the given sub cycle. The expected switching energy loss for each subdivision of the cycle (ESUB) in an inverter leg is defined in (10a), where i_1 is the fundamental phase current, Im is the peak phase value of basic current and Φ is the line-side power factor angle. The average value of over a fundamental cycle, shown in (10b), gives the mean of a number of values of switching energy loss per sub cycle.

$$E_{SUB} = \frac{n|\dot{\mathbf{i}}_1|}{I_m} = n|Sin(\omega t - \phi)| - - - -(10a) \text{ -------- (10a)}$$

$$E_{SUB\,(AV)} = (1/\Pi) \int_{0}^{\Pi} E_{SUB}\, d\omega t \text{ -------- (10 b)}$$

2. CONCLUSION

The work introduces a new SVPWM switching strategy based on double-switching bus clamping sequences for three phase two level inverter. The group of BCPWM techniques, which employs only the double-switching bus clamping sequences, is proposed. The proposed novel double switching bus clamping sequences using SVPWM techniques are studied, and compared against CSVPWM and existing BCPWM techniques at a given standard frequency switching are analyzed. The proposed families of BCPWM techniques result in minimum line current ripple than CSVPWM and the existing BCPWM algorithms at lofty voltages occurred in line close to the highest line side voltage during linear modulation. The analysis presented explains the difference in distortion because of different techniques. The study is classified both BCPWM and the proposed novel bus clamping PWM algorithms with space vector into two methods, namely continual clamping methods and split clamping methods, according to the type of clamping adopted. Split clamping methods are most suitable than continual clamping methods for line current distortion. While designing the inverter, continual clamping is suggested for high power factors and split clamping is for low power factors as per switching losses consideration.

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Crawler Bot

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Abstract— **Among the many justifications for using robotics, the most important is to shield people from working in dangerous environments and from handling hazardous materials. From dealing with chemicals that are explosive to handling radioactive substances. The main objective of this project is to minimize human causalities in tragedies. This robot is remotely controlled; self powered and has all the controls like normal car which are controlled by a microcontroller unit. A wireless camera has been installed on it, so that it can monitor surroundings remotely when required. An obstacle sensor is used protect the robot from collision.**

Keywords- **DTMF, ARM7, Motor drivers, Sensors, DTMF decoder, Wi-Fi Module..**

I. INTRODUCTION

This robot is controlled by android and it has sensors like IR (Infrared Sensor) for obstacle detection and also temperature sensor. A wireless camera has been installed on it, so that it can monitor remotely when required. It can enter into even those areas where a human cannot reach and send us all the information through its tiny Camera eyes. This spy robot can be used in star hotels, shopping malls, jeweler showrooms, etc where there can be threat from intruders since human life is always precious, and those robots are the replacement Among the many justifications for using robotics, the most important is to shield people from working in dangerous environments and from handling hazardous materials. From dealing with chemicals that are explosive to handling radioactive substances.Robots are ideal for use in hazardous environments by removing people from direct exposure to unfriendly conditions such as materials that are radioactive or highly explosive. Wireless camera will send real time video and audio signals which could be seen on a remote monitor and action can be taken accordingly.

II.OVERVIEW OF EXISTING SYSTEM

- There is much advancement in the field of engineering robotics in particular many robotics systems have been developed for various purposes there are certain systems which are used for automatic motion of vehicles in road and wheel chairs which can help disabled
- Drones can also be used for rescue systems but drones are noisy and consume more power.
- For transmitting audio and video, RF camera has been used.
- RS 232 is used for interfacing at transmitting and receiving end.

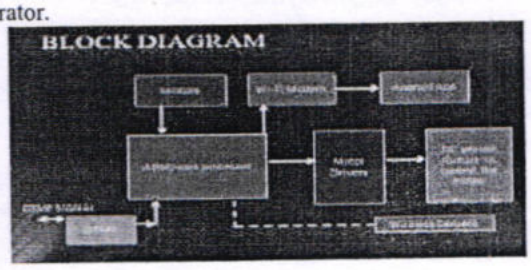
III. OVERVIEW OF PROPOSED SYSTEM

Robot unit:

- This unit is placed on the robot. It has mainly 4 parts:
- Microcontroller: It is the heart of the device. It controls all the activities of the unit.
- Sensors: sensors like obstacle detection are installed on the unit to get different environment parameters.
- Trance-receiver: This unit communicates between the unit and the base station.
- Motor drivers and motors: Motors are used for movement of robot i.e. Left, Right, Forward, Backward & to point the laser gun.
- Wireless camera: This is a CCTV camera which is used to monitor surrounding environment conditions.
- Wi-Fi modem-To give the notifications and alerts to the rescue team

Base Unit

- This unit is present in base station. This can be a computer system or a remote controller with a display unit.
- The robot movements and surrounding conditions are continuously controlled and monitored by the operator.



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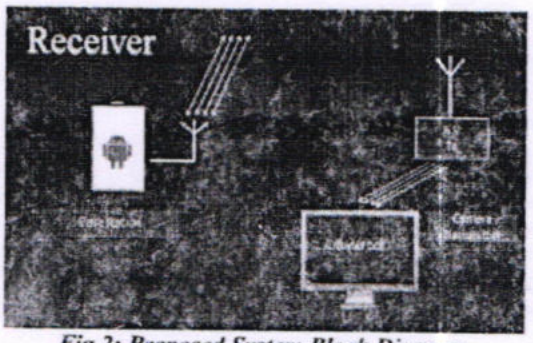
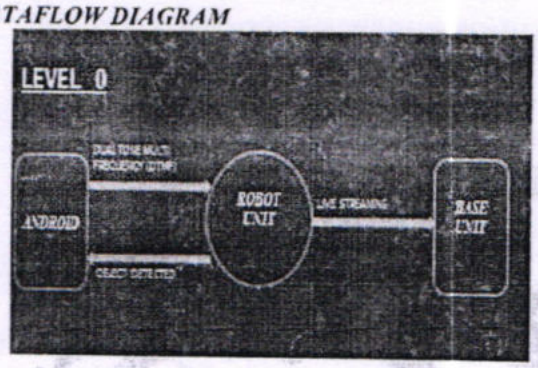


Fig 2: Proposed System Block Diagram

DATAFLOW DIAGRAM



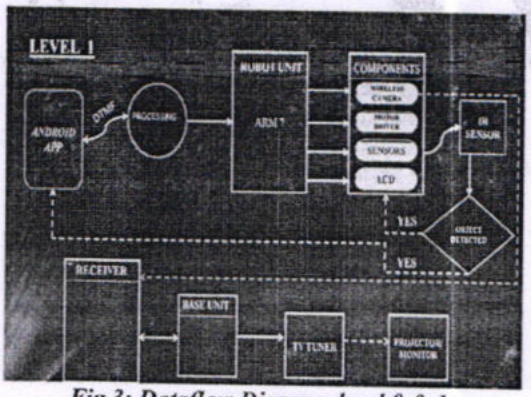


Fig 3: Dataflow Diagram level 0 & 1.

DTMF signal is sent to the DTMF decoder through mobile phone keypad and then those signals are in the form of DTM frequency.

So decode these signals we need DTMF decoder, decoder will decode the signals and then it will send to ARM7 and from ARM7 signals are passed to the motor driver.

SYSTEM ARCHITECTURE

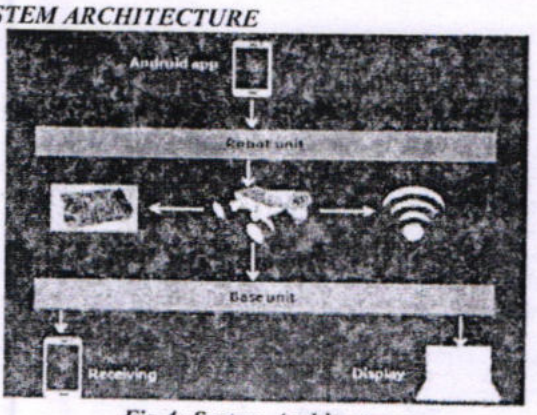


Fig 4: System Architecture

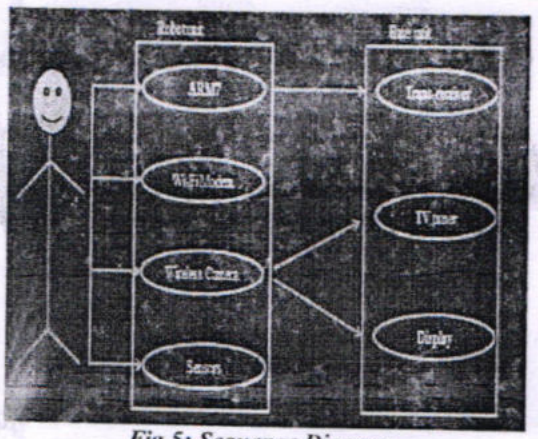


Fig 5: Sequence Diagram

IV.COMPONENT AND SOFTWARE

Hardware

- ARM7 CORE processor (for firmware storage and logic), LPC2148 or lpc 2148
- Appropriate LED's, diodes, resistors, relays, capacitors etc.
- Power supply for the unit
- Relay driver
- LCD display
- Wireless Trance-receiver unit
- obstacle detector
- Wi-Fi-modem

Software

- Android studio
- KEIL IDE.
- Philips Utility.
- Embedded C

V.CONCLUSION

- In our project, the robot is designed to move by our command and also by its own according to the command given by the program.
- The video and audio are monitored at the control unit.
- In this prototype project, we design in such a way that this robot can be moved anywhere and it can get the information of particular place.
- It is easy to detect any faults or dangerous in the industry. It leads easy process without interaction of human.
- An alerting message will be sent to a prescribed SIM using GSM module.
- This project is very much useful in the places where a human cannot go into the places like ground canals, smoke oriented caves and this project is very much useful in such situations.

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Brain to Brain Communication

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Abstract: -- **"Brain-Computing Interface" technology is used by the scientists that allow computer to analyze brain signals. This new technology in the field of research and development will bring a great benefit to the people who cannot speak and even blink. This will be first technology that would allow people to send words, images and thoughts directly to the minds of others, particularly people with a disability .Earlier we've looked at a system to allow people to control a robotic wheel chair with the power of thought. Similarly B2B communication technique will be used to transmit thoughts from one person to another via internet. This paper outlines on component used and working of B2B communication. We have also discuss its advantages and limitations.**

I. INTRODUCTION

A BCI is a communication and control system which does not depends any way on the brain's normal neuromuscular output channels. Rather than by peripheral nerves and muscles the user's intent is conveyed by brain signals, and these brain signals does not depends for their generation on neuromuscular activity. Furthermore, a BCI establishes a real-time interaction between the user and the outside world, as a communication and control system. The user receives feedback reflecting the outcome of the BC'Is operation, and that feedback can affect the user's subsequent intent and its expression in brain signals. For example, if a person uses a BCI to control the movements of a robotic arm, the arm's position after each movement is likely to affect the person's intent for the next movement and the brain signals that convey that intent. Thus, a system that simply records and analyzes brain signals, without providing the results of that analysis to the user in an online interactive fashion, is not a BCI. A brain–computer interface (BCI) or brain–machine interface (BMI) activates electronic or mechanical devices with brain activity alone. BCIs and BMIs allow direct brain communication in completely paralyzed patients and restoration of movement in paralyzed limbs through the transmission of brain signals to the muscles or to external prosthetic devices.

The two types of BCIs: Invasive BCIs use activity recorded by brain implanted micro- or macroelectrodes, whereas noninvasive BCIs use brain signals recorded with sensors outside the body boundaries. A technique called "Brain-computer interfacing" is used by scientist which allow computer to analyze brain signals. Without the use of keyboards, telephone, mouse,mouth thoughts can be transmitted from one person to another person's mind miles away, but through internet. A brain computer interface (BCI), sometimes called a direct neural interface or a brain–machine interface, is a direct communication pathway between a brain and an external device. BCIs are often aimed at assisting, augmenting or repairing human cognitive or sensory-motor functions.SS

II. HISTORY

In 1875 Richard Canton recorded electrical signals produced by brain activity from the cortical surface in animals and from human scalp by Hans Berger in 1929. Human EEG was discovered by Hans Berger and speculated his first comprehensive review of his experiments with the ''Elektrenkephalogramm'' in 1929 about the possibility of reading thoughts from the mathematical analyses sophisticated by tracing EEG. First human to human brain to brain interface, was built between two humans separated by the internet to communicate with each other by international researchers. BCI is no longer a new thing said Dr. James and Professor Kevin Warwick from University of Reading shown person to person communication via the nervous system.

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III. COMPONENTS USED IN B2B COMMUNICATION

- ***Brain Computer Interfacing***: A brain computer interface (BCI), is also called as direct neural interface or a brain machine interface (BMI). It is a direct communication between the brain and an external device. It is often aimed at assisting, augmenting or repairing human cognitive or sensory motor functions.

- ***Electrodes:*** It is an electrical conductor used to make contact with a nonmetallic part of a circuit (e.g. an electrolyte, a vacuum or a semiconductor)

- ***EEG:*** Electrical activity of the brain is recorded by the **Electeoencephalography.** It is placed along the scalp. EEG measures voltage fluctuations results flow of ionic current within the neurons of the brain. EEG is used to diagnose sleep disorders, coma, encephalopathies and brain death. But as well as the technology's susceptibility to noise, extensive training is required to another substantial barrier to use EEG as a brain computer interface before users can work the technology.

- ***LED lamp: A light-emitting-diode lamp*** is a two lead semiconductor light source of p-n junction diode which emits light. It is a solid-state lamp that uses light-emitting diodes (LEDs) as the source of light. Multiple diodes are used together, since the light output of individual light-emitting diodes is very small compared to incandescent and compact fluorescent lamps. LED lamps can be made interchangeable with other types. Most LED lamps must also be included internal circuits to operate from standard AC voltage. Since LED lamps offer long life and high efficiency its initial cost is higher than that of fluorescent lamps.

- ***Internet:*** Dr. James said that his innovation was the transmission of the signals to another person through the Internet.

- ***Personal Computer***: Pc is used to pick up the stream of binary digits and also it can decipher whether a zero or one was transmitted.

IV. WORKING PRINCIPLE

This system is used to share thoughts from one brain to another without any talking or without moment of body. International researchers made a device that allows to share a information between two person. The researchers tested the device by placing them 8000km (5000miles) apart one in France and other in India. The device connects directly to the users scalps and impulses from the sender were picked up with EEG as well as by image guided and robot assisted transcranial magnetic simulation (TMS). The signal was encoded and sent through the internet to the user on the other end. Once it reached its target destination, the code was delivered to the recipient by a computer interface. The device worn by the recipient stimulates phosphenes, even though actually any light does not enter the eye it appears as flashes of lights. The phosphenes are delivered in a pattern, which needs to be deciphered by the recipient who wears a blindfold to block out other visual stimuli. Using this method users could able to transfer two words called "ciao" and "hola" with some errors. This EEG method is the best choice at this stage as it is noninvasive.

V. APPLICATION AREAS

- ***Gaming and Entertainment*** : In future gamers will be able to drive the cars, trucks, etc,. by just saying turn "left" turn "right" and "brake" etc. BCI also can be used to enjoy your music with home theater by handling an entertainment

system with your thoughts which will make a remote control obsolete.

- ***Communication and control*** : BCIs provide options for communication and control for people with devastating neuromuscular disorders (such as amyotrophic lateral sclerosis, or ALS, brainstem stroke, cerebral palsy, and spinal cord injury).

- ***Military defense system***: DARPA (Defense Advanced Research Projects Agency) has been interested in Brain-Machine-Interfaces for a number of years for military applications like wiring fighter pilots directly to their planes to allow autonomous flight from the safety of the ground. DARPA looks to develop a high-res brain computer interface.

VI. ADVANTAGES

Help people with severe debilitating muscle wasting diseases, or with the so-called 'locked-in' syndrome, to communicate. Help in direct brain communication in completely paralyzed patients. Help to those who suffers from disorders like Brain stroke. Help in contact with the patient who is conscious but couldn't able to speak. Help the people to communicate each other easily who is def and dumb.

VII. LIMITATION

- ***Electrodes*** : Attachment of Electrode inside the skull or even implanting in the brain. But Dr James admitted that this opened up many ethical problems.
- ***Liability*** : Under normal circumstances, we are fully responsible for our actions is agreed by most people. However, incorrect actions may be produced simply by incorrect detection of correct intent, if our intent was effected by a brain–computer interface.
- ***Privacy*** : The capacity to induce information into the brain may provide us with the ability to base our actions on a better assessment of the environment. Because this information is provided by a computer, it could be accessed and modified by third parties, which may allow them to influence our actions .
- In terms of the speed, accuracy and robustness of the technology, there is long way to go.

VIII. FUTURE

- It will provide a new way to communicate without the need of telephones and keyboard.
- According to Dr Ian Pearson, "In 30years, you'll think of a message and it will appear on your wife's mobile phone".

IX. CONCLUSION

Brain-to Brain communication will help people who suffers with "Locked –In" syndrome, with severe debilitating muscle wasting diseases. It can also be used in our military defense system. One person can chat brain-to-brain at speed of thoughts with the person miles away. The technology will cut down the verbal communication in coming era. A broadband connection, however, would be essential.

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Biometric Verification Using Face Recognition

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Abstract: -- **Real time challenges are eternal for verification & recognition of a person."An image is worth more than ten thousand words!!"Automatic detection/ recognition of people is a challenging problem which has received much attention in the recent years. Face recognition concept is one of the successful & important application of image analysis. It's a holistic approach towards technology & has potential applications in various fields.**

This paper provides an overview of real time applications of face recognition concept. We have proposed an efficient algorithm by generating a code based on MATLAB platform. The basic techniques which we have used are categorized into 2 parts i.e. Feature based including skin color model, geometry based model; and template matching. We have also discussed about various color space models. We have segmented the various parts of the face using mapping and then made use of Viola Jones method & Artificial Neural Networks which includes Gabor filter in order to compare the test image with the images in our database to find the similarities and hence recognize the person.

Keywords:- **Face recognition, Viola Jones, Gabor filter, Artificial Neural Networks Template Matching.**

I. INTRODUCTION

"You may delay, but time will not" as said by Benjamin Franklin, time is very precious. Every time a lecture, section or laboratory starts, the lecturer or the teaching assistant delays the lecture to record attendance of the students. This is a lengthy process and takes a lot of time and effort. Especially if it is a lecture with a huge number of students. It also causes a lot of disturbance and interruption when an exam is being held. Moreover the attendance sheet is subjected to damage and loss while being passed on between different students or the teaching staff. Apart from wastage of time while taking attendance there are few other problems such as false attendance popularly known as "proxy", lack of dedicated time for teaching, resulting in incompletion of syllabus, maintaining records of attendance, mispronunciation of names. To find a solution of these we use the Advanced Digital Image Processing and its real time application using MATLAB.

The main advantage of biometric systems over the normal automated system is that they really do what they are supposed to do, which is authenticating the user, in a way initiating the human capabilities; and using real human physical characteristics, which are unique for all and impossible to change. In addition, some researches proposed that biometrics are not subjected to theft, loss or passing to anyone else like what is done with cards or passwords. While some other objects point out that they are not a secret and could be falsified or stolen from computer systems.

In today's era of fast growing biometric systems, several approaches of face detection have been proposed. In this algorithm a method for face detection in color images has been implemented. Detecting of faces in color faces has become important for a face detection system, as the color being one of the timely and most useful components to extract skin regions. There are numerous color models that constitute an image viz. RGB, YCbCR, HSV color models. As a primary color model, we worked on RGB by specifying the general range for Red (R), Green (G) and Blue (B) color intensities.

II. DIGITAL IMAGE PROCESSING

It is an area characterized by the need for extensive experimental work to establish the viability of proposed solution to a given problem. Digital image processing encompasses processes whose inputs d outputs are images and in addition, includes processes that extract attributes from images.

Image processing includes:-

1. Image display and printing

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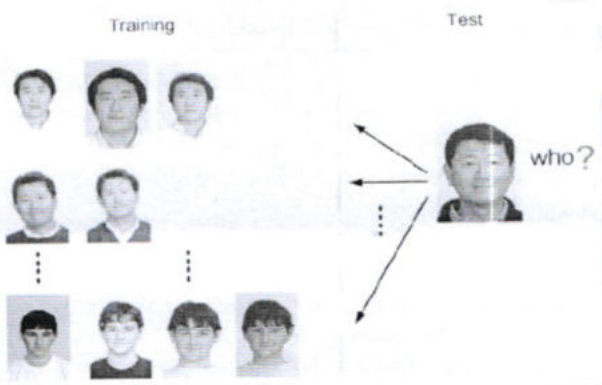
2. Image editing and manipulation
3. Image enhancement
4. Feature detection
5. Image compression

In this thesis, we are working with face detection system which can detect static images. Human activity is a major concern in a wide variety of applications such as video surveillance, human computer interface and face recognition. Detecting faces is the first and the most important step in these applications. Face detection can be viewed as a two-class (face vs non-face) classification problem. This skin patches are detected after applying lighting compensation technique. The facial features are subjected to verify feature maps for the eyes, mouth and face boundary. This approach is very much sensitive to illumination, color variations, hence we moved towards template matching.



Facial Feature Detection

- It is possible that some of the detected skin tone regions will include some non-face regions whose color is similar to the skin tone.
- The face feature detection module rejects face candidate regions that do not contain any facial features such as eyes, nose and face boundary.
- This module can detect multiple eye and mouth candidates.
- A triangle is constructed from two eye candidates and one mouth candidate and the smallest enclosing ellipse of the triangle is constructed to approximate the face boundary.
- A face score is computed for eyes, mouth and ellipse, and if it exceed threshold it is then considered as a face.

Face Detection Approaches

The attempt to automate human recognition initiated the research in the field of face detection. The existence of variable illumination, complex background and d pose variation adds constraints to an efficient and robust face detection system. In this section, we review existing face detection techniques over a single intensity or color images. Image detection methods here are classified into 2 types:-

1. ***Feature based method***
   A. Skin color based
   B. Geometry based
   C. Appearance based
   D. Edge based

2. ***Template matching***
   A. Artificial neural networks and Gabor filter

Skin color based

Human skin color has been used and proven to be an effective feature in many applications from face detection to and tracking. Although different people have different skin color, several studies have shown that the major difference lies largely between their intensity rather than their chrominance. The skin pixel detection in RGB space is difficult as it is not perceptually uniform and the color components are very sensitive to the intensity.

Geometry based

Most of the face detection approaches utilize size and shape to find the face candidate and then verify these candidates using local, detailed features such as eye brows, nose, mouth and hair. A typical approach begins with the detection of skin like pixels, as mentioned above. Next, skin like pixels are grouped together connected component analysis or clustering algorithms. If a connected region has an elliptical or an oval shape, it becomes a face candidate.

The symmetry of face patterns has also been applied to face localization. A face triangle is drawn utilizing the eyes and mouth indicating a face candidate.

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Appearance based

Gray values are the most important parameter for the face detection. Face detection performance is effected by light intensity and occlusions. Contrasted to the template matching methods where the template are predefined by experts, the templates in appearance based methods are from the examples in the image. Appearance based methods rely on techniques from statistical analysis and machine learning to find the relevant characteristics of face and non-face images.

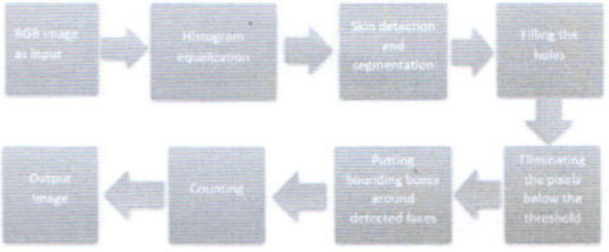
Edge based

The edge information is extracted and used to detect face. These methods can handle large variations of the face images but require processing for illumination normalization. Edge detection is the foremost step in deriving edge representation. So far, many different types of edge operators have been applied. The Sobel operator was the most common filter among the techniques. A variety of first and second derivatives (Laplacian) of Gaussians have also been used in the other methods.

Template matching

Input image is compared with predefined face template, pose and shape. In template matching, a standard face pattern (usually frontal) is manually predefined or parameterized by function. Given an input image, the correlation values with the standard pattern are computed for the face contour, eye, nose and mouth independently. The existence of face is determined based on the correlation values. This approach has the advantage of being simple to implement. However, it has proven to be inadequate for face detection since it cannot effectively deal with the variation in scale, pose and shape. Multi resolution, multi scale, sub-templates and deformable templates have subsequently been proposed to achieve scale and shape invariance.

Block diagram representation



HSV Color Space

Hue (H) is a measure of the spectral composition of a color and represented as an angle, which varies from 0 to 360. Saturation (S) refers to the purity of colors and intensity of pixel is defined by the Value (V) which ranges from 0 to 1. HSV model is related to human color perception. Conversion from RGB to HSV color system is done using the following equations:-

$$H_1 = \cos^{-1}\frac{0.5[(R-G)+(R-B)]}{\sqrt{(R-G)^2+(R-B)(G-B)}}$$

$$H = H_1 \quad if \quad B \le G \quad H = 360^0 - H_1 \quad if \quad B > G$$

$$S = \frac{Max(R,G,B) - Min(R,G,B)}{Max(R,G,B)}$$

$$V = \frac{Max(R,G,B)}{255}$$

Condition in the HSV color space for skin regions:-
0<H<360
H>=0 && H<=50
S>=0.1 && S<=0.9

Face detection steps

The following steps are followed in order to find the regions where face may be found:-

1. Normalize the test image.
2. Take two template images from database and normalize them.
3. Apply 2-D convolution between test image and template images.
4. Find the regional maxima in both convolved images where the maximum found is set to 1 and all other regions are set to 0.
5. Combine the regional maxima of both the images into one image which will give the position where the face features may be found.

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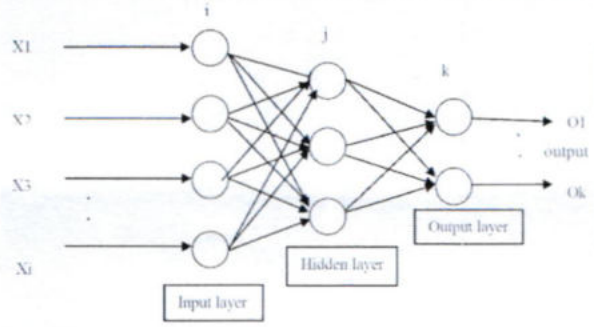
III. ALGORITHM

We are using Artificial Neural Networks for training our system for face and non-face data feature where our ANN has three layers, one input layer, one hidden layer and one output layer. The size of the hidden layer is fixed to 100 and the input layer is from -1 to +1. For calculation purpose, the hyperbolic tangent sigmoidal transfer function is used and is described as:-

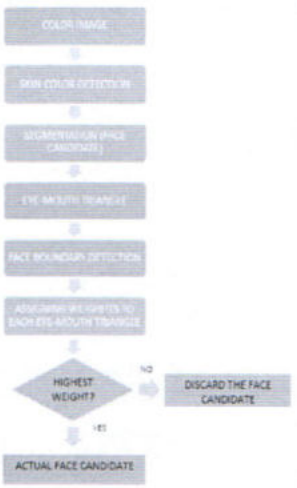
$$A = \frac{2}{1 + e^{-2n}} - 1$$

Where, n is the number of inputs to the ANN.

For checking the performance of the network, we have used the mean squared error with regularization performance function that measures the measures the network performance as the sum two factors, mean squared error and the mean squared weight, and the bias value. The scaled conjugate gradient back propagation function as been adapted for training the whole network.



Flow Chart Representation



Viola Jones Approach

The basic principle of the Viola Jones algorithm is to scan a sub window capable of detecting faces across a given input image. The standard image processing approach would be to rescale the input image to different sizes and then run the fixed size detector through these images. This approach turns out to be rather time consuming due to the calculation of the different size images. Contrary to the standard approach, Viola Jones rescale the detector instead of the input image and run the detector many times through the image – each time with a different size. At first, one might suspect both approaches to be equally time consuming, but Viola Jones have devised a scale invariant detector that requires the same number of calculations whatever the size. This detector is constructed using a so called integral image and some simple rectangular features reminiscent of Haar wavelets.

IV. CONCLUSION

The algorithms mentioned above are in the hierarchical order of their complexity and accuracy. Skin color based algorithms like RGB, YCbCR and HSV methods could yield the output for simple images. However, they failed for the images which have complex background and poor or non-uniform illumination. Moving to the improved methods, we worked on geometrical features where eye and mouth parts were extracted using a method in which face triangle is drawn. This approach overcame the dependency of face area and complex background. However, it failed again in terms of poor illumination and in different orientations. Hence a better method would be the one which is independent of color variation and illumination. This directed us to work on template matching algorithms like Gabor filter and ANNs. For a class room environment constructing a database is not a problem. Since the classroom contains a pre-defined number of students. These databases are used to match with the test image, an image taken by the camera, in a real-time scenario. So far this is the best algorithm among the above mentioned and best suits for our problem statement.

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Autonomous Agile Flying Robot (Quad rotor)

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Abstract: -- **An unmanned aerial vehicle also known as UAV is anunpiloted aircraft which can either be remotely operated or flown autonomously based on pre-programmed flight plans. Usually these types of vehicles are used in military applications for missions that are too dangerous for manned aircraft. They are also used in a growing number of civil applications such as aerial photography and the transport of various goods. The last decade has seen rapid progress in micro aerial robots, autonomous aerial vehicles that are smaller than 1 meter in scale and 1 kg or less in mass. Winged aircrafts can range from fixed-wing vehicles to flapping-wing vehicles , the latter mostly inspired by insect flight. Rotor crafts, including helicopters, coaxial rotor crafts,ducted fans, quadrotors and hexarotors, have proved to be more mature with quadrotors being the most commonly used aerial platform in robotics research labs.This paper focused on the development of a family of trajectories defined as a sequence of segments each with a controller parameterized by a goal state.This approach permits the development of trajectories and continous enabling aggressive maneuvers such as flying through narrow,vertical gaps and perching on inverted surfaces with high precision and repeatability.This design describes a flying quadrotor prototype of 750gms,38 cm diameter with on board altitude estimation and control that operates autonomously.The bot is designed to be controlled by PCB circuits with usage of microcontroller, actuators and sensors. The controlling programs are to be stimulated by MAT LAB/Arduino.This work will be useful in the field of Defence,Navigation,Automation and also could be a multi utility product.**

I. INTRODUCTION

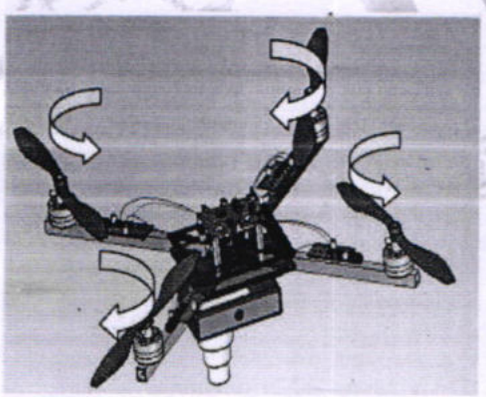

Fig. 1 Flying robot

The last decade has seen rapid progress in micro aerial robots, autonomous aerial vehicles that are smaller than 1 meter in scale and 1 kg or less in mass.

Winged aircrafts can range from fixed-wing vehicles to flapping-wing vehicles, the latter mostly inspired by insect flight.Rotorcrafts, including helicopters, coaxial rotor crafts,ducted fans, quadrotors and hexarotors, have proved to be more mature with quadrotors being the most commonly used aerial platform in robotics research labs. In this class, the Hummingbird quadrotor sold by Ascending Technologies, GmbH, with a tip-to-tip wingspan of 55 cm, a height of 8 cm, mass of about 500 grams including a Lithium Polymer battery and consuming about 75 Watts is a remarkably capable and robust platform. Of course micro aerial robots have a fundamental payload limitation that is difficult to overcome in many practical applications. However larger payloads can be manipulated and transported by multiple UAVs either using grippers or cables. Applications such as surveillance or search and rescue that require overage of large areas or imagery from multiple sensors can be addressed by coordinating multiple UAVs, each with different sensors. Our interest in this paper is scaling down the quadrotor platform to develop a truly small micro UAV. The most important and obvious benefit of scaling down in size is the ability of the quadrotor to operate in tightly constrained environments in tight formations.While the payload capacity of the quadrotor falls dramatically, it is possible to deploy multiple quadrotors that cooperate to overcome this limitation. Again, the small size benefits us because smaller vehicles can operate in closer proximity than large

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vehicles. Another interesting benefit of scaling down is agility. As argued later and illustrated with experimental results, smaller quadrotors exhibit higher accelerations allowing more rapid adaptation to disturbances and higher stability.

II. COMPONENTS

Onboard controller hardware: Following

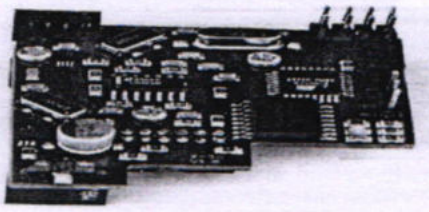

Fig. 2 Controller hardware

a minimalistic approach, the central controller board was kept as simple as possible in order to reduce cost and failure rate. It consists of three low-cost piezo gyroscopes, an 8-bit digital to analog converter (DAC) and an AVR microcontroller.

Table 1: Component Specifications

S.No.	Components	Specifications
1	Brushless DC motor	Speed-1200rpm/v Voltage-11.1 V
2	ESC	Max.current- 30 A Cut-off voltage-4V
3	Propeller	Size- 10"x 4.5"
4	Li-po Battery	Voltage : 11.1 Capacity : 1800mAph
5	Indiuno	Op.voltage-5V
6	LM35 sensor	Temperature Range- (-55 to + 150°C)
7	Ultrasonic sensor HC SR04	Distance Range- (2-500 cm)

Despite this very lean design, this controller is very capable due to efficient control algorithms. The central controller board is used to read sensor-data, compute angular velocities and angles in all axes and to run independent control loops for each axis. Thus, the highest accuracy can be achieved. All processing is done with a control loop frequency of 1kHz. The main consequence of high frequency control is a low drift rate of the relative angles, as errors arising from time discrete integration are small, and a very stable flight because of very short deadtimes in the control loop. Furthermore, the high update rate facilitates FIR filtering sensor data in software without generating big delays. This capability reduces vibrations and shakiness during the flight.

Onboard Controller Structure:

The onboard controllers are three independent PD loops, one for each rotational axes (roll, pitch and yaw). Angular velocities measured by the gyroscopes and computed relative angles are used as inputs. The angles are derived by integrating the sum of the output of one gyroscope and an external control input for the respective axis. Without an external input signal the calculated integral represents the angle the flying robot has turned in the respective axis. Looking at the closed loop and disregarding measurement noise and integration errors, this means that the robot will always keep its current orientation. The integrated angles can be shifted by an external control input. As a result, the robot"s orientation changes proportionally to the input. Its movements are controlled by steering it to a certain orientation and keeping this orientation for a certain time. Due to measurement noise and discrete integration the integrated angles drift about ±3 degrees per minute. However, this drift can be easily compensated by a human pilot or an autonomous external position control such as a motion capture system. Figure shows the

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principal structure of our onboard controllers commonly referred to as "heading-lock". The controller implementations have been optimized for shortest possible execution time and robustness in almost every flight situation. Three controllers are running in parallel on an 8-bit AVR microcontroller (ATMega8). The loop is interrupt triggered, which enables stable time constants for integration and filtering. By using the AVR"s internal ADCs at a high sampling rate, fixpointarithmetics only, runtime optimized FIR filter implementations and interrupt driven I2C communication to update the motor speeds, we achieved a system running at a control frequency of 1kHz.

b) Basic Structure Of The Onboard Control-Loops:

All controller parameters have been set empirically and optimized experimentally over several months. Our central controller board including the controllers is compatible to the Silverlit X-UFO, which is available on the international toy market. From January to September 2006 we had 35 people beta-testing the hardware and optimizing parameters within hundreds of hours of human controlled flight. During this period both, hardware and software, have been optimized as far as possible. The result is a very reliable hardware revision of the central controller board, as well as a set of controller parameters capable of reliable control during slow movements as well as during fast maneuvers, even including loops where the robot is inverted for short periods.

c) Brushless Motors And Rotors:

The brushless outrunner motors used in our flying robot are a special design for low rpm applications. The stator diameter is 22.5mm, the stator height 5mm. The windings result in a motor constant of 1000rpm/V . The weight of the complete motor is 19g. The rotor was designed to fit directly to the left and right turning propellers from the Silverlit X-UFO. Those propellers are available very cheap as spare parts of the X-UFO and offer good performance with excellent safety as they are very flexible.

III.AUTONOMOUS FLIGHT

We implement autonomous flight by using an external sensor system (i.e. motion capture system) to compute the position, height and yaw for the robot. The sensor system can be GPS or DGPS for outdoor applications, or any kind of indoor tracking systems like a sensor node network, an ultra sonic position measurement or an optical motion tracker.

IV.AUTONOMOUS FLIGHT USING A MOTION CAPTURES SYSTEM:

We have performed hundreds of hours of human controlled flights with our platform. Those experiments demonstrate the robustness, stability and endurance of our platform. In this section we focus on autonomously controlling the robotindoors. We use an external sensor system that is reliable indoors motion capture system that uses a system of cameras to compute position information.

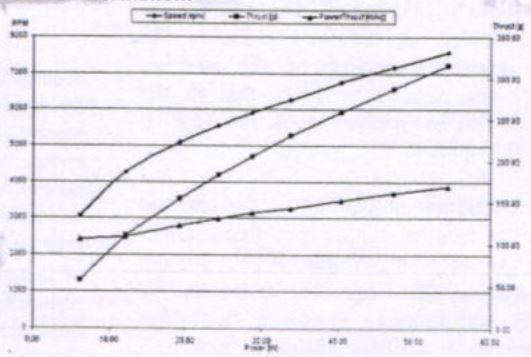

Fig. 3 Variation of RPM with power

a) Experimental Setup: The autonomous flight controlexperiments were performed in the "Holodeck" lab at MIT.

This lab is equipped with an indoor motion tracking system by VICON that can measure the position vector of specific points on the body of the robot. These points are marked by incorporating small tracking balls on the body of the robot at the desired locations. We measure the robot"s position vector

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$$\underline{x} = \begin{pmatrix} X \\ Y \\ Z \\ \varphi \end{pmatrix}$$

where X, Y and Z are the Cartesian coordinates relative to the motiontracker"s origin and is the orientation in yaw. To get reliable measurements of this vector we used three markers tracked by the motion tracking system and arranged them in the configuration of an isosceles triangle. We attached one marker to the front of the flying platform, one to its right, and one to its left hand side. Given the Cartesian coordinates of each marker, the robot"s position and orientation can be determined using simple geometry. The markers" positions are transmitted via a TCP/IP-Link to a computer running the position control algorithms. After identifying the markers by mapping them to a model of the robot, the robot"s orientation and position is calculated and provided as real-time input to the controllers. The update frequency of the position controllers is set and limited to 50Hz due to the limitations of the R/C transmitter used for sending commands to the flying robot.

The performance and stability of the onboard electronics make this external control loop frequency of 50Hz adequate for achieving stable flight. In our experiments we observed that frequencies as low as 5Hz result in stable performance. However, a higher frequency enables higher position accuracy, especially during fast maneuvers. The system diagram is shown in Figure. The transmitter we used is a standard model helicopter R/C. However, we had to modify the internal electronics using another AVR microcontroller to connect it to the laptop. The protocol of the serial interface allows us to select a source independently for each of the channels. The source can either be the joystick for human control or the PC-software. This system has a user interface for developing the position controllers which enables debugging, testing and optimization step by step.

*b) **Position control***: The laptop receives the datastreamfrom the motion tracking system and outputs data to the transmitter. There are four independent controllers running on the laptop computer. They are implemented using a customized C++ software module. The control loops are timer triggered to enable a precise 50Hz update rate. The Yaw-Controller was implemented as a PD loop. Inputs for the controller are the measured yaw angle, its FIR lowpass filtered derivative, and the desired yaw angle (heading). The height controller is non linear and was implemented using an

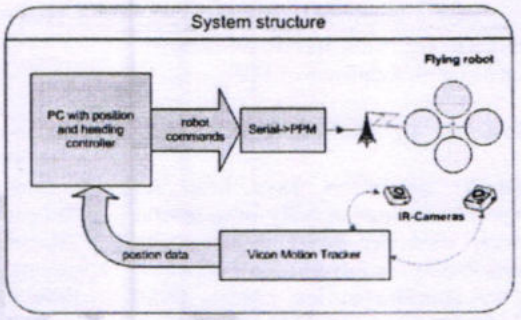

Fig. 4 System Structure

accumulator. The idea is to maintain a mean value for the total thrust required to get the robot hovering. This mean value has to adopt to battery voltage drop and to compensate for payloads. Adaptation is achieved by an accumulator that counts up whenever the robot is below its desired height, and down otherwise. In addition to this controller we use a second controller that is capable of fast response to compensate for sudden changes like turbulence and wind. The second controller is implemented as a standard PD-loop. Figure shows the structure of the height controller.

The X-axis and Y-axis controllers are identical and were more challenging to derive. The system is harder to control in these degrees of freedom since there is no proportional behavior response. The inputs of the onboard controllers are proportional to the rotational velocity in pitch and roll, but they are not directly proportional to horizontal speed. For this reasons we designed a cascaded controller system. The inner controller cascade is a horizontal speed controller that uses horizontal speed and acceleration as inputs Controller structure of the height controller weighting the accelerations, we achieve "predictive" behavior in this controller, much like a human pilot controlling this

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system would have. The outer controller cascade is a PD-controller whose output is the desired speed for travel to the desired position. Figure shows the structure of the X and Y position controllers.

V.CONTROLLER STRUCTURE OF THE X AND Y POSITION CONTROLLERS:

All controller parameters have been determined empirically and tuned experimentally. Finding parameters was easy. We believe this is due to the good stability properties of the robot and its high-rate update.

a) Hovering Accuracy:

In the first experiment the flying robot was commanded tomaintain its flight position at

$$\underline{x_0} = \begin{pmatrix} x = 0mm \\ y = 0mm \\ z = 1000mm \\ \varphi = 0 \end{pmatrix}$$

The following figures show the achieved position accuracy while hovering for 150 seconds. The data in figures 7, 8, and 9 show that the flying robot"s deviation from its desired position is less than ± 10cm in X. Probability for X/Y-Positions trying to stay at X = Y = 0m.

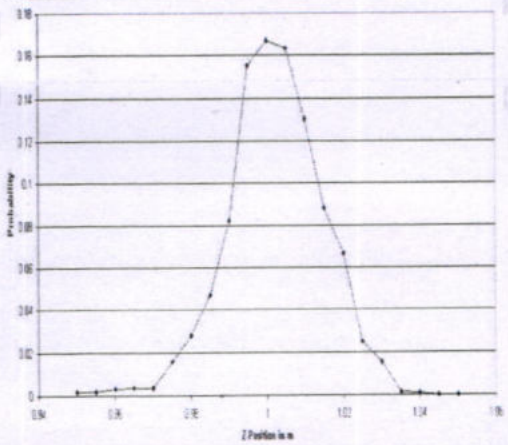

Fig. 5 Probability for X&Y positions Probability for an actual height Z at desired Z = 1m.and Y

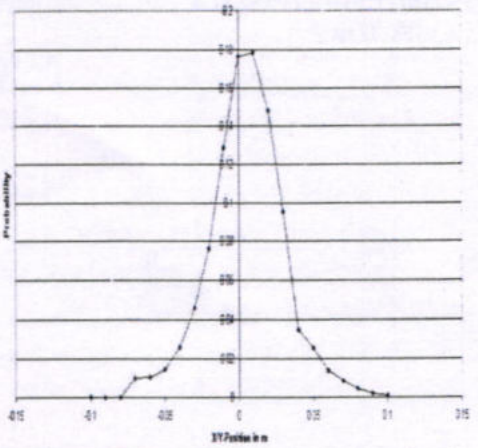

Fig. 6 Variation of x & y with z axes and ± 4cm in Z axis and is within ±1 degree in

VI.FOLLOWING A TRAJECTORY:

In the second set of experiments the robot was controlled to follow a trajectory including auto takeoff and landing. The robot was commanded to start at the center of a square with a side length of 1.2m. After a successful auto takeoff to a height of 1.0m the robot was required to travel to one of the corners, then to follow the perimeter of the square, and finally to return to the center of the square and execute an autonomous landing maneuver. This experiment was repeated 10 times. Figure shows the results of this experiment. The desired trajectory is marked in red. The measured trajectory is marked in blue. The entire maneuver (including autonomous takeoff and landing) takes 55 seconds to complete. The maximum deviation to the desired square was 0.1m, which is consistent with the hovering results. Probability for an actual heading at desired heading = 0.

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VII.FLYING ROBOT FOLLOWING A TRAJECTORY

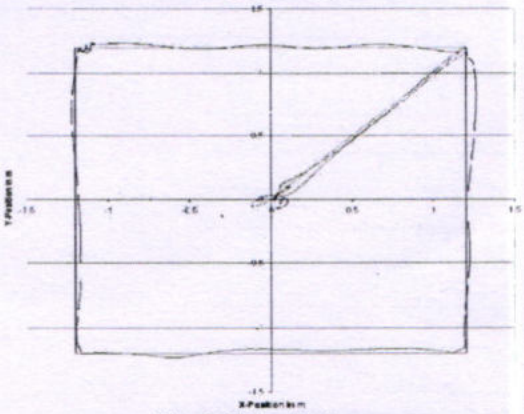

Fig. 7 Flying Trajectory

VIII.CONCLUSIONS:

In this paper we presented a reliable and efficient solution for a UAV. Our solution is simple, stable, and inexpensive. The key innovation is a platform capable of very high update rates and the development of simple, adaptive, and highly optimized controllers. Our plans for the future include testing the platform in combination with acceleration sensors for dynamic and acrobatic maneuvers. We also plan to continue our work with a second generation platform offering even longer flight times and larger payload capabilities. Ultimately, we wish to see this platform used as a mobile node in mobilesensor networks that use cameras for mapping, monitoring, and tracking. We have already done some preliminary experiments in which our smaller platform was controlled to fly indoors and outdoors while carrying a video camera. These preliminary experiments show promise for using our approach in the development of a practical aerial mobile sensor networks.

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Automatic Headlight Dipper

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Abstract: **-- An automatic system of dipping the headlight in cars and other road vehicles which automatically dims the glare of the opposite car which reflects on the driver's eye which can prevent many accidents happening across the globe. The system includes a Photodiode or LDR to judge the intensity of light, Ultrasonic Sensor for sending and receiving signals, Arduino UNO microcontroller and embedded C programming.**

Keywords:- **Photodiode, LDR, Arduino UNO, Ultrasonic Sensor, Embedded C.**

I. INTRODUCTION

One must have come across the irritating situation while driving at night when we find the Headlight Lamp focus from an opposite vehicle straight to our eyes, making things difficult to assess, giving rise to a situation of some collision or some kind of possible accident.

Highbeam lights in vehicles Incidentally, the driver of the opposite vehicle might be going through the same situation due to the focus our vehicle. Such situation are normally tackled by using normal dipper or manual dipper switch mechanism, where the driver is prompted to "dip" the focus of his headlight, thus giving the opposite vehicle a chance to adjust his vehicle and also an indication that he too needs to "dip" his vehicle lamp. However, doing the operation manually every now and then can become horribly laborious and troublesome, therefore if an automatic system is incorporated, it can save this headache of the driver in stressful conditions and on dangerous roads and highways.

Fatal road accidents happening at night

The following describes an effective auto head lamp dimmer or dipper.

II. SYSTEM ARCHITECTURE

The system architecture is very simple as well as logical. Here are some of the basic componenets the each car should have:

1. Arduino uno microcontroller
2. Ultrasonic sensors
3. Photodiode
4. Notification system

Arduino uno microcontroller:

Connection of Ultrasonic Sensor with Arduino UNO Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It

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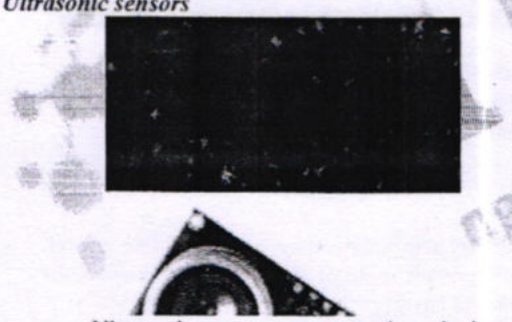
contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter evry to get started.

Photodiode

It is used to detect the intensity of light falling on it. its output is connected to the input of microcontroller. A **photodiode** is a semiconductor device that converts light into current. The current is generated when photons are absorbed in the **photodiode** . A small amount of current is also produced when no light is present. **Photodiodes** may contain optical filters, built-in lenses, and may have large or small surface areas .It is placed behind the rear view mirror.

Ultrasonic sensors



Ultrasonic sensors are sensing devices they work in 2 modes ,namely:

- Active mode
- Passive mode.

When it is transmitting signal ,it works in active mode and when it receives a signal. it works in passive mode. It is placed in the front part of the car. It will generate signal in the form of high frequency sound wave having frequency anything above 20,000Hz which is greater than human audible range. It travels at a speed of 330m/s which is higher the speed of any vehicle and hence can tranmitt and receive signals very fastly,within a fraction of mineroseconds. The HC-SR04 **Ultrasonic** Module has 4 pins. Ground. VCC. Trig and Echo. The Ground and the VCC pins of the module needs to be **connected to** the Ground and the 5 volts pins on the **Arduino** Board respectively and the trig and echo pins to any Digital I/O pin on the **Arduino** Board.For programming purpose. we need to download SR04 library and install to Arduino IDE.

Notification system:

In this context.it is used to inform to the driver to switch the vehicle's headlights to low mode.It can be in the form of beep sound or any other form.

III. DIFFERENT MODES

The proposed system works in three different Automatic modes which are:

1. Auto-Dimming Mode
2. Notification Mode
3. Semi- Automatic Mode

The automatic mode can be switched by the driver from normal mode using a switch provided in the dashboard. The auto dimming mode is an automatic mode in which driver need not to worry about dimming the headlight. The proposed system will automatically dim the high intensity sensed by the LDR or the photodiode. The second mode is the Notification mode in which the driver will be given a notification to dim his vehicle's headlight using a beep sound or a pre-installed voice message. The third mode is the Semi automatic mode in which initially the system will be in notification

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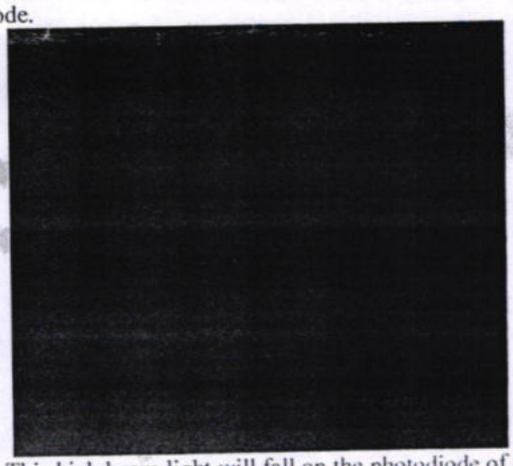
mode which will changes to automatic mode after a fixed programmed time. This mode can be useful for deaf people.

IV.WORKING PROCEDURE

Here are a few steps that will explain the working of this system This requesting signal is received by the sensor of the other car..

1.When two cars are approaching each other in opposite direction and the other car has its headlight in high beam mode.



2. This high beam light will fall on the photodiode of the other car.
3. This information is sent to microcontroller to which it is connected.
4. When the intensity of this light crosses a certain predefined value,the microcontroller will direct ultrasonic sensors to transmit a requesting signal to the car having high beam opposite to it.
5. This sensor is connected to the microcontroller of the car,which then will respond as follows:

- If the system is in automatic mode,the car headlights will automatically switch to dim mode,without intervention of the driver.
- If the system is in notification mode, notification (in the form of beep sound) will occur repeatedly until the driver switches to low beam.
- If the driver do not do so,the headlights will automatically switch to low beam after a predefined time interval.
- If the system is in normal mode, notification (in the form of beep sound) will occur and the driver will switch the car headlights to low beam.

6. All this will take place within a fraction of second, since we are using ultrasonic sensors.
7. If the car is already in low beam the nothing will happen.
8. After the vehicles pass by each other the headlights will again switch to its previous mode.

V. CONCLUSION

In this paper the system is proposed with three modes to control the vehicle's headlight beam and avoid accidents as much as possible. A user friendly interface is available in the vehicle's system. It is also friendly for disabled people(deaf people). The implementation of this idea will be a major step towards elimination of road accidents, as its very cause is being eliminated here.

Acknowledgement

A similar idea was proposed by Edwin Land in the year 1948. This was discussed by him in summer camp Land when he attended that at the age of 14. His idea consisted of a polaroid which was to be fixed on the car's front glass. This idea was rejected due to high installation cost of polaroid including it's wear and tear.

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Automated Content Based Short Text Classification forFiltering Undesired Posts on Facebook

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Abstract: -- **Online Social Networking (OSN) sites are always helpfulforbeingsocializedand togetexposedtoasocial environment. But, privacy and prevention of undesired posts on user wallis the only problem of biggest concern. User should have the ability to control the message posted on their own private wall to avoid undesirable contents to be displayed. The existing OSN sites have very little support regarding this problem. For example, Facebook filters messages on the basis of identity of senderi.e. only friend, friend of friend or group of friends can post any message; no content based preferences are supported. Taking this fact into consideration, the proposed work contributes to address such problem through a machine learning baseds of the classifie for labeling messages in support of contents of message. This work experimentally evaluates an automated scheme to filter out unwanted messages posted on Facebook walls by as signing a set of categories with each short text message based on its contents.**

IndexTerms—**Online Social Networkingsites,OSN,Content based classification, Short Text Classifier, Machine Learning, wall posts,facebookwall,user profile**

I. INTRODUCTION

Social networking site sare the mostinter active medium for sharing information like; photos,blogs, thoughts, reviews, comments etc. This social media is gaining much importance and popularity day by day over most of the other mediums for business perspective such as; advertising various sells products, promoting new mobile applications and many more. Most of the social networking sites have common features in them. The basic feature of social networking sites is the ability to create and share a personal profile. Social networks also let you post photos, statuses,feelings and personal belongs on your profile page. One of the most common features of online social networks is to find and make friends over the network. These friends also appear as links, so visitors can easily browse your online friend network. According to face book statistics,1 million links are shared, 2 million friends are requested and 8-10 million messages have been send for every 30 minutes on Facebook.

The content present in social network is constituted by short text, and the not able example is the messages written by Social Network users on particular private or public areas, known as general walls. In support of displaying contents of user's own wall most of the social sites has the feature of preventing the messages from unwilling people on the basis of friendship status. In the presents cenario, let us suppose if any one of the user's friend posted some objection able text, before user get the notification and before removing that message from time line manually it might have been seen by many other users, which should not happen. So,there should be a mechanism which will automatically restrict such posts. Up till nowno feature is present which filters the message in accordance with the contents of the message, no matter about the identity of the person who is posting it. Taking this problem into consideration, an automated system, to filter undesired comments from owner's wall is proposed. For filtering the short length text messages onuser wall content based short text classification methodology is proposed here.

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Generally, content based filtering algorithms are mostly used in recommender systems for calculating the utility values for particular item and recommending other items to the user which have higher degree of similarity to the user's profile. Where in, here the content based filtering technique is applied for the social networking site Facebook for filtering unwanted messages or posts on userwall.

The proposed system includes, the machine learning based short text classifier, a social network manger and the content based message filtering rules. According to the survey on related work it has been found that many authors proposed systems which are based on contents based filtering, but no one had worked on actual existing online social networking sites. The proposed work is the only one which is actually implemented on existing online social networking site Facebook.

There mainder of the paper is organized as follows: section II gives the problem definition, section III informs about the related work,section IV, V, VI gives the brief over view of the Methodology, Basic Architecture and experimental design. Finally,sectionVII concludesthepaper.

II.PROBLEMDEFINITION

Currently, OSN does not provide message content based preferences to control messages on userwall. Therefore, it is not possible to prevent undesired messages, such as political or vulgarones, without concerning about the other user who posts them. As the wall messages consists of short text with limited word occurrences and include informal / colloquial abbreviated language; providing as ervice of message filtering is not only amatter of using web content mining techniques, rather it requires to design ad-hoc short text classification strategies. Hence, the automated content-based short text classification technique I required to filter out unwanted messages.

III.RELATEDWORK

Content based filtering is generally used for recommender system sorf or web page filtering. The basic idea of content based filtering came through authors Gediminas Adomavicius and Alexander Tuzhilin[2].Their paper presents an overview of the field of recommender systems and describes the current generationof recommendationmethodsthatareusually classified into the following threemain categories: content-based, collaborative, and hybrid recommendation approaches.

AuthorHuiLi, Fei Caiand Zhi fang Liao [3]have combined probabilistic model and classical content-based filtering recommendational gorithms to proposea new algorithm for recommendation system, using Hidden Markov Model. The basic approachd escribed in this paper is calculating the similarity of user profile and each profile of all the items and recommending item to satisfy user need or tastes.

Michael Chauand Hsinchun Chen [4]expanded the idea of content based filtering for filtering the webpages. They used the ML paradigm along with Web content analysis and Web structure analysis. Marco Vanetti, Elisabetta Binaghi, Moreno Carullo,Elena Ferrari and Barbara Carminati [1]put for ward the idea of using content based filtering for OSN. They provide the facility to have straight rules over their own wall to avoid the unwanted messages to be posted.The basic aim of having a control over the posts is achieved through a Filtered wall(FW). The system described in this paper blocks the undesired messages sent by the user. But the drawback of this system is that, the user will not be blocked; only the message posted by the user will be blocked. To over come this problem, Black list rule can be implemented as future enhancement.

The messages on facebook consist of short texts. Handling such short text messages for filtering purpose is one of the majorissues becauses hort texts do not have sufficient word occurrences. To deal with such short text messages authors Josh Weissbock, Ahmed A.Esmin, Diana Inkpen[5] proposed the methodology to enhance the text of the messages that contain link with externalin for mation such as the title of the webpages and/or most frequent terms from these webpages. This paper also says that the results of the classification improve substantially by adding this externalin formation.

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model (VSM). According to VSM the document is represented as a vector of binary or real weights.

Dj= w1j…w|T|j

Where ,ڴ is a set of terms/features that occurat least once in at least one document of the collection ڴ rand wkjℵ [0;1] represent show much term tk contributes to the semantics of document dj.

In the case of non-binary weighting, the weight wkj of term tk (here,term represents word) indocument dj is computed according to the standard term frequency -- inverse document frequency (tf--idf) weighting function[1], defined as, tf–idf(tk, dj)=#(tk, dj).log (1) Where #(tk ,dj)denotes thenumber of times tk occur in document dj and # Ɋr(tk) de notes the document frequency of term tk. Document property is adopted by collecting the correct words, bad words, capital words, punctuation character, exclamation marksetc.In moredetail,

- Correct Words: This expresses the number of terms tk ℵڴ|K, where tk is the term of document dj and K denotes the known words.
- Bad Words: This can be computed same as correct words feature, here K de note the dirty words in particular language.
- Capital Words: This denotes the amount of words writtenincapitalletters.Itiscalculatedas fractionof words having more than half of the characters in capitalcase. Fore.g. Valueof"To DO orNoT TOdo" is 0.5; excludingthe initial word of message.
- Punctuation Characters: This can be calculated by the fraction of total number of punctuation character in the message by total number of characters in the message. For e.g. the value of this feature for the message "hi!! What's up?"is5/14.
- Exclamation Marks: This can be calculated as the fraction of the total numbers of exclamation marks in the message by total number of punctuation characters in the message. For e.g. Consider "Hello!!! How r u?" is 3/4.
- Question Marks: This can be calculated as the fraction of total numbers of question mark in the message by total number of punctuation character in the message. For e.g. consider "hi! How u doing?"is 1/2.

D.Machine Learning Based Classification Technique[1]
Consider M1 and M2 be the two levels of classifier. Let vectory1 be the belonging ness to the neutral class. Suppose, TrS D and Te SD are training and test sets respectively.

The learning and generalization phases work as follows:

- For meach message mi,if feature vector xii sextracted, the trainingandtestsetsarethentransformedas,TrS=
- {(xi;yi),…(x|TrSD|,y|TrSD|)} andTeS={(xi;yi),…(x|TeSD|,
- y|TeSD|)}.Binaryset iscreatedformessageM1 as TrS1= {(xj,yj)
- =jy ,(jy,jx)|SrTℵ yj1}.ForM2amulticlasstrainingsetiscreatedas,TrS2 =
- {(xj, yj)ℵTrS|(xj, yj|).yjk=yjk+1,k=2,…,|ö|}.M1istrainedwithTrS1to recognizewhethermessage isneutralornon-neutraland evaluatedusingTeS1.M2istrainedwiththenon-neutralTrS2forcomputing gradualmembership to the non-neutral classes. The testingisdonethroughTeS2.

V.BASICARCHITECTURE

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Authors Sriram, Bharath[6] again proposed the approach which effectively classifies the text to apre defined set of generic classessuch as News, Events, Opinions, Deals, and Private Messages on the basis of author information and features with in the twits. Accordingtosurvey on relatedworkonthe sameconcept, many authors proposed their work. Reddy, M.Vamsi Krishna [7]proposed their work on the same content filtering principle. They created a web application which performs the functionality, but it is restricted for only one computer as it is a standal one application where admin has rights to generate filteringpolicies.

Rose,J.Anishya and A.Pravin [8],Ezhilvani,V.,K. Malathiet.al[9], Dhruv VashisthaandSivagami.G.[10] ,Bala Kumar,Bercelin Rose Mary and Devi Mareeswari[15] are many other authors who proposed their work which defines the filtering and black list rules for filtering the posts. Authors Thilagavathi,N., and R.Taarika[13] proposed their work on same line for filtering messages posted on OSNwalls. They used the inference algorithm to in fer the new rules from the existing rules in support of content based filtering. From all this related survey we inferred that, efforts have been taken for filtering undesired posts on OSN created by them.But,tillnow no work has been done on the actual Online Social Networking site.They all worked on OSN prototype. Hence, we proposed the scheme which will be directly implemented on actual facebook site.

IV.METHODOLOGY

It has been found that noone worked on the actual existing social networking sites like twitter or Facebook. Hence,by considering the further enhancement, application of filtering rules on real time Facebook site has been invented. The proposed work is the implementation of the filtering rules on the contents posted on Facebook user walls to avoid unwanted posts t obedisplayed. The techniques used are explained here shortly,

A.Content BasedFiltering

Information filtering systemsare designed to classifya stream of dynamically generated information dispatched asynchronouslybyaninformationproducer and present to the user those information that are likely to satisfy his/her requirements. Incontent-based filtering, each user is assumed to operate independently. As are sult, acontent - based filtering system selects information items based on the correlation between the content of the items and the user preferences as opposed to a collaborative filtering system that chooses items based on the correlation between people with similar preferences.

B.Short text Classifier

The message sposted on OSN walls are usually short text messages. Handling such short text for filtering purpose is one of the major issues because short texts do not have sufficient word occurrences. For such situations, a short text classification technique is applied here to supports hort text messages. The basic aim of using the short text classifier is to recognize and remove the neutral sentences and to categorize them. This classifier is hierarchical [fig1].It consists of two levels. The first level is the hard classifier level, in which message are classified with neutra landnon-neutrallabels.

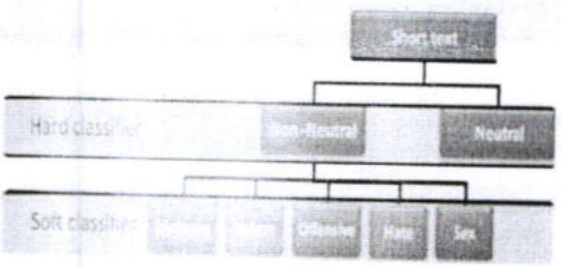

Fig.1. TextClassifier

In the secondlevel which is the soft classifier level, all non- neutral messages develop gradual membership. These grades will be used in succeeding phases for filtering process by considering proper there shold values. Short text classifier includes text representation and Machine Learning based Classification.

C.Text Representation[11]

Extracting the particular features from a given set of information is crucial task; this affects the entire performance of classification. For text representation the module used is Vector space

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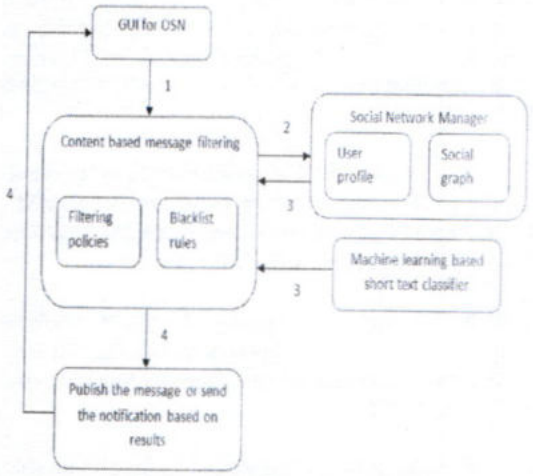

Fig.2. Basic Architecture

- When user wants to post a message on a private wall, he/she tries to enter into a wall and the user tries to post messagesontheprivatewallbutitisinterceptedbythe filter wall.(1)
- Secondlymachinelearningtextclassifieris usedtoextract themetadatafromthegivencontentofmessages.(2)
- Thenthefilterwallmakeuseofthismetadatawhichis providedbytheshorttextclassifierandalong withthe data extractedfrom theuser profilebyenforcingthefiltering rule.(3)
- Thefilterwallspublish or blockthemessagedepending on the result ofprevious step.(4)

A. Filtering Rules

For defining the filtering rules the issue that shouldbe considered may be themessagewith differentmeaning and significancebasedonthecreatorofmessage.Hence, here the type, depth, and trust value are recognized by creator specification.

Definition 1: (Creator specification) A Creator specification creatorSpec implicitly denotes a set of OSN users. Itcanhave one of thefollowingforms,possibly combined:

A set of attribute constraints of the forman OP av, where an is a user profile attribute name, av and OP are, respectively, a profile attribute value and a comparis on operator,compatible with an's domain. A set of relationship constraints of the form(m,rt, min Depth, max Trust), denoting all the OSN users participating with user mina relationship of typert, having a depth greater than or equal to min Depth,and a trust value less than or equal to max Trust.

Example 1: The creator specification CS1=(Age<16, Sex=male) denotes all the males whose age is less than 16 years, where as the creator specification CS2 = (Henry, colleague,2,0.4) denotes all the users who are colleagues of Henry and who set rust level is less than or equal to 0.4. Finally, the creator specification CS3 = (Henry,colleague,2,0.4,(Sex = male)) selects only the maleusers from those identified by CS2.

The final component of a FR is the action that the system has to perform whether block or notify, with the obvious semantics of blocking the message, or notifying the wall owner. An FR is there fore formally defined as follows.

Definition 2: (filteringrule) A filtering rule FR is at uple (author, creator Spec, content Spec, action),where, author is the user who specifies the rule. Creator Spec is a creator specification, specified according to

Definition 3: Content Spec is a Boole an expression defined on content constraints of the form (C,ml) where Cisa class of the first or second level andml is the minimum membership level there shold required for class C to make the constraint satisfied. action ,kcolb)ϰ notify) denotes the action to be performed by the system on the messages matching content Spec and created by users identified by creator Spec. In the proposed work above explained techniques are experimentally evaluatedon Facebook.

V. EXPERIMENTALDESIGN

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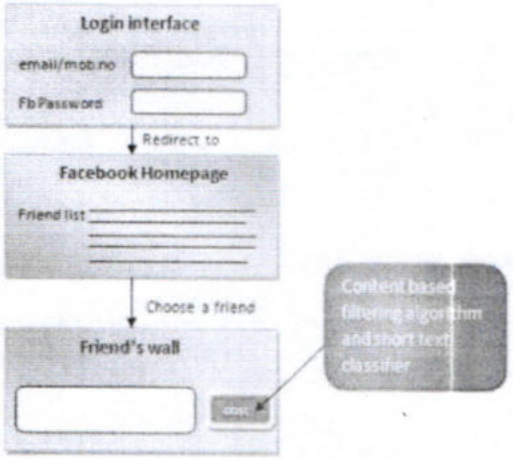

Fig.3. ExperimentalFlow

There isonelogininterface where userhastoenterhis/her logindetailsforsigninginto Facebook account.Thisredirects theusertothe Facebook homepage.Usercanselectany other usertosendmessage.Whenusertriestosendamessageit first get interrupted by the content based filteringalgorithm. Basedonthe results generated byalgorithmtheobjectionable post isrestricted.Ifthemessagecontentis neutralthesystem will post the message.

VII.CONCLUSION

Traditionally,contentbasedfiltering wasusedfor recommender systems.But,here we used thecontentbased filteringtechniquealongwithMachinelearningbasedshort textclassifiertofilterunwanted messages postedon Facebookuserwalls.Thisleadstothepreventionofundesired poststo bedisplayedtootherusers. However,infuturewecanapply thesetechniqueson othersocial networkingapplications like Twitter,Whatsapp etc.

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Applying Intermittent Energy Distribution for Evading Energy Holes in Wireless Sensor Network

ArpithaVasudev, A.M. Sowmya and G. Manjula

Abstract— *This paper proposes a non-uniform answer for the vitality opening issue. The system is shaped by a huge number of modest sensors, arbitrarily scattered over a roundabout region and the sink situated at the inside. The sensors deliver information with the same rate and the information makes a trip from the hubs to the sink in a multi-bounce form, utilizing a most limited way steering. The essential thought, so as to stay away from the vitality gap around the sink, is to prepare each organize zone with such a great amount of vitality as the movement heap of that zone. Firstly, an unadulterated systematic expression for the activity load is determined and after that, taking into account this expression, a non-uniform organization is proposed, with variable surface thickness, for a specific number of lethargic hubs. Every time a dynamic hub depletes its battery, a close torpid hub gets to be dynamic and has its spot.*

Index Words— *Wireless Sensor Networks, Energy Holes, Intermittent Method.*

I. INTRODUCTION

WIRELESS sensor systems (WSN) remain a thriving exploration field for over 10 years now. They typically comprise of countless cost secluded sensors which are sent, haphazardly or intentionally, terminated a topographical zone. The goal of such a system is to sagacityvarious sort of surrounding capricious and report this data to a social affair theme (additionally called sink). The dispersal of information is expert by a remote callous. Hence the WSNs are a great decision for situations everywhere the foundation of reinforced systems is inconceivable or exceptionally hard to accomplish. There arenumerous varieties of such systems relying upon the tender prerequisites and ecological requirements. Broad-spectrum prologue to the meadow can be initiate in [1].

The remote way of WSNs styles it conceivable to develop expansive rule systems, casing completely a topographical zone. The most straightforward approach to accomplish this is by a multi-jump form, i.e., feelers createinformation as well as in the meantime demonstration additionally as transfers for exchanging those information detected by nearby sensors.A key variable of this kind of systems is the vitality utilization, since it is firmly identified with the system's lifetime when antennae are cordless hang on as it is for the most part the case in WSNs.

Despite the fact that there are various methodologies endeavoring to diminished the expended vitality [2], the supposed vitality gap has been turned out to be an unavoidable issue on account of a uniform system with a static sink [3], [4]. This issue emerges at the point when the voyaging information approaches the sink. Because of merging, the sensors close to the sink convey the weight of sending more information than whatever is left of the hubs and therefore the region around the sink is rapidly left purge of vitality. This paper is attempting to go up against the vitality gap issue with non-uniform vitality appropriation.

As Lian et al. portrayed in [5], to stay away from the vitality opening, the regions close the sink could be furnished with torpid hubs, as vitality stores. At the point when a dynamic hub loses its vitality, a torpid hub has its spot and constant the past typical operation. In any case, they just give the arrangement spellbindingly what's more, examine the general structure, the viability and the attainability, deprived of giving the correct integer of the required torpid hubs, nor the required arrangement thickness. Moreover, they are not worriedabout theprocedure of exchanging between the depletedand the new hub. The slog exhibitedhere utilizationsthe matching primary thought as in [5] yet gives an explanatory countenance to the hub's thickness as a capacity of the separation from the drop, the real numeral of the prerequisite torpid hubs and a straightforward calculation for the exchanging progression between the lethargic dynamic countries.

II. RELATED WORK

Different non-uniform answers for the vitality gap issue have stood anticipated. The easiest one is the non-uniform hub sending, as indicated by which the apparent thickness of pivots is capricious, resilient further hubs on the zones close to the sink. These additional hubs are detecting and handing-off information as the typical ones do. In the fundamentally the same as arrangement of non-uniform vitality, the distinction is that the additional hubs are really lethargic, sitting tight for a foreigner hub to fumes its succession until they make a move. Together the above arrangements have been proposed by the same creators in [5]. This paper broadens the later slant by determining an equation for the thickness of the lethargic hubs. Wu et al. in [4] are taking after the main line of attackalong with a unique directing convention which adjusts the movement stack among hubs with the same separation from the sink. The disadvantage is that the organization is not arbitrary but rather needs extremely cautious situating of hubs and

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moreover, it needs a tremendous number of additional hubs (the quantity of hubs takes after a arithmeticalextent whereas drawing closer the sink).

Ammari and Das in [7] intend a blended plan, taking into account concentrictrinkets nearbythe sink, with variable starting freestyle glassyand inconstant radio-run for every ring. There are numerous different arrangements in view of variable radio-range, for example, [8], [3] furthermore, [9]. Alternative group of non-uniform arrangements depends on the blend of sole and multi-bounce spread. The hubs close to the sink convey a piece of their information by amulti legway, whereas whatever remains of the information are conveyed specifically to the sink by a solitary jump. In actuality, hubs that are not near the sink take after the typical multi-bounce worldview, conveying most or the majority of their information to their neighbors. This kind of arrangement is displayed without precedent for [10] and it have been trailed by numerous variations, for example, [11] and [12]. The expository equation for the hub's thickness gritty later in this work is enlivened by [13].

The creators depict a scientific display for the vitality opening, expecting a undeviating and thick system.They isolate the system territory hooked on concentric rings and gauge the movement heap of every ring as a capacity of the ring number. The drudgery introduced here amplifies the ring demonstrate by utilizing a constant variable tactic and subsequently the inferred recipe for the activity stack does not encompass the specific concentricring number, yet just the separation from the sink. The proposed capacity of the torpid hubs thickness that takes after depends on this explanatory articulation of the activity stack.

III. EXISTING SYSTEM

Extend d assumes an essential part in WSNssince by evolving its esteem, the normal level of the system likewise changes. The point here isto determine a nearby connection flanked by the normal notch g and the range d as takes after. Prior to the hubs' sending, an arbitrary point P is picked and afterward, N01 hubs are arbitrarily spread over the system zone lastly, the last hub being set at point P. The N01 hubs are consistently dispersed over the system zone with a steady surface thickness 0 = A, so there are (by and large) d2 hubs inside the scope of point P. Take note of this expect either thatpoint P is not at the system limits or unending system measurements (a broad talk of this outskirt impact can be found in). This work embraces the equivalentdefinition for the heap asalso.

Beneath the conditions portrayed in, the vitality consumption is just identified with the information conveyed by every hub. The information of a hub v incorporates not just the bundles created by the hub itself additionally those bundles created by the relatives of v in the steering tree (hub v goes about as a hand-off for these hubs). The movement stacks of a hub are the number of parcels prepared to bediffused at hub v at a specific time case. Given that all hubs deliver one parcel for each time unit, the total number of bundles at any hub adds up to the quantity of its relatives in addition to the one bundle delivered by the hub itself and obviously. Clearly the vitality utilization is relative to the movement stack (basically stack in the future). Since the heap of particular hub is an irregular variable, the normal heap of a range is characterized as the mean estimation of the heaps of all hubs inside this range.

A strict demarcationfor the normal heap of a specific fact (not a whole range) can be characterized as takes after. Assume that every purpose of the system has polardirections. The heap of a hub v isa detached arbitrary inconstant which relies on upon the attributes of the organize N0, g, the steering arrangement and the directions of that hub. For an altered blend of N0, g and steering, the likelihood of a hub v to have stack `v will be connected as it were with the directions of that hub. Let indicates the likelihood mass capacity of the irregular variable gives the likelihood of a hub with directions to have stack consider the r as ceaseless parameters of the likelihood bulk capacity.

IV. PROPOSED SYSTEM

After the arrangement the dynamic hubs frame a directing tree, taking after the typical way, i.e., the sink starts the steering pyramid development itself existence the root and whatever is left of the hubs begin conveying information to the sink. Amid the typical maneuver of the system the torpid hubs are just occasionally earshot for an INVITATION motion from the dynamic hubs. The control motions amongst dynamic and torpid hubs might be exchange through an alternate channel than the standard (or information) one, with a specific end goal to maintain a strategic distance from any random gatherings from the torpid hubs and in this way, to keep their battery as crisp as could reasonably be expected.

Upon the gathering of an INVITATION flag, a lethargic hub reacts to the despatcher with a READY flag, alongside its ID. At the point when a dynamic hub is near fumes its battery, sends an INVITATION flag and sits tight for the READY reacts. It picks the react that originates from the closer lethargic hub and after that conveys to this hub a WAKE-UP flag. In the meantime the depleted hub illuminates the sink for its pending demise by sending a NEW-TOPOLOGY flag through the standard channel. A lethargic hub gets to be a dynamic one when it gets a WAKE-UP flag. It opens its circuit and holds up the control memosfrom the sink to take an interest in the development of the following directing tree. The sink, quickly in the wake of getting the NEW-TOPOLOGY flag, starts the development of another directing tree. The coming about tree will contain the previous lethargic hub, yet as a dynamic hub now, with a crisp battery. After that, the depleted hub pull back from; the system and shuts its circuit.

A. Algorithm: The active Swapping algorithm

Algorithm node

Step1: If State=Active

Step2: State=Active or Sleeping

Step3: If Active,Receive data and send data to next node

Step4: On exhausting the battery,send invitation to all nodes

Step5: Once sent receive the node ID of ready nodes

Step6: Collect node details and wake up nodes, then Get the new topology and send it to sink

Step7: When battery is almost zero,Use the new topology for data transfer

The above algorithm demonstrates the procedure of the adjustment between a dynamic and a torpid hub, in pseudo code. See here that there are no contrasts amongsta dynamicand a torpid hub, aside from their underlying estimation of themunicipal capricious. Both sorts of hubs are running the same calculation and are really the unchanged, in this manner, the best possible state estimation of every sensor can be decided before sending.

V. RESULT

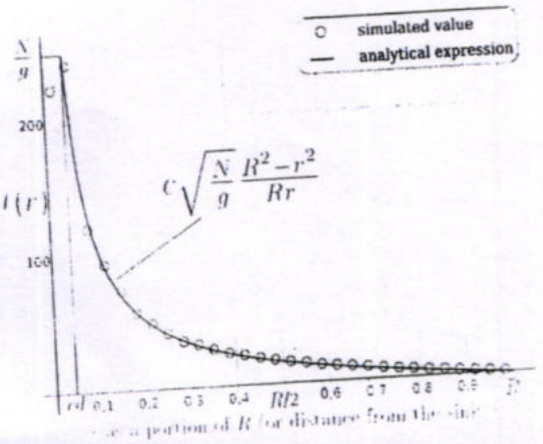

Figure 1: General Vitality Consumption

The general vitality consumption Figure 1 is just because of the information exchange. Another key variable, separated from the epoch, of any non-uniform arrangement is the vitality usage, signified by u. This is the rate of the utilized vitality as a small amount of the aggregate beginning vitality and obviously the bigger the u the lesser the waste vitality. All reenactments are performed for asettle number of dynamic hubs.

VI. CONCLUSION

Above technique gives an solution of the vitality gap issue utilizing torpid hubs with the same surface thickness as the activity stack. Initial, an expository articulation of the activity stack is inferred and after that an arrangement procedure, in view of this expression, is created alongside a straightforward calculation for the exchanging between the dynamic lethargic states. The number of required lethargic hubs is not irrelevant, around 10 times. The underlying dynamic ones, however the remuneration is a change of thesystem lifetime around 50 times. Given that the cost of the remote sensors must be little, the proposed arrangement is considered as moderate as for the hubs cost.

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Android Speech Recognition Based Voice Command Notice Board

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Abstract— **In this paper, the development of simple and low cost Android based wireless notice board is presented. The proposed system uses either Bluetooth or Wi -Fi based wireless serial data communication. For this purpose Android based application programs for Bluetooth and Wi-Fi communication between Android based personal digital assistant devices and remote wireless display board are used. At receiver end, a low cost microcontroller board (Arduino Uno) is programmed to receive and display messages in any of the above communication mode. Using the developed system, two different applications for displaying messages on a remote digital notice board and wireless person calling has been implemented. The developed system will therefore aims in wirelessly sharing the information with intended users and also helps in saving the time and the cost for paper and printing hardware.**

Keywords: **android; bluetooth; microcontroller; wi-fi; wireless notice board**

I. INTRODUCTION

Smart phones are playing vital role in human life. They are easy to use, promising and durable devices that help in performing day to day tasks. Embedded systems using wireless technologies are widely used for communicating with peripheral devices. Implementation of the GSM based wireless communication for different applications are proposed in [1-5]. GSM based wireless notice board has been developed in [6], [7].

In this paper, the development of a simple and low cost wireless Android based notice board is presented. The proposed system uses either Bluetooth or Wi-Fi based wireless serial data communication in displaying messages on a remote digital notice board. Android based Application programs available for Bluetooth and Wi-Fi communication for personal digital assistant (PDA) devices are used for transmitting the alpha- numeric text messages. Using the Bluetooth or Wi-Fi based serial data communication technique, the corresponding transceiver module has been interfaced with microcontroller board at the receiver end. For this purpose, a low cost microcontroller board (Arduino Uno) is programmed to receive alphanumeric text messages in any of the above selected communication modes. The proposed system will help in reducing the human effort, paper, printer ink and cost for manual changing of the notices.

II.SYSTEM DESCRIPTION

The simple and low-cost wireless Android based notice board system is developed to remotely send the desired information instantly to the intended users using either Bluetooth or Wi-Fi transceiver modules interfaced with a low cost Arduino UNO microcontroller board. The communication mode (Bluetooth or Wi-Fi) is selected for data communication using the corresponding transceiver module with the microcontroller. Arduino UNO microcontroller board is programmed [8], [9] as a client using Arduino software to receive the message from remote user either in Bluetooth and Wi-Fi based wireless communication technology [10]. The system block diagram is shown in Fig. 1.

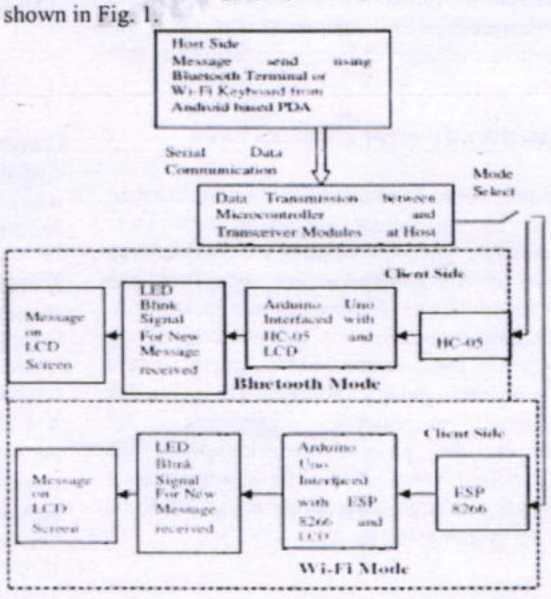

Fig. 1. System Block Diagram

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III. WIRELESS COMMUNICATION FOR ANDROID BASED NOTICE BOARD

From the communication mode selected by the user, Bluetooth or Wi -Fi based wireless communication for Android based notice board is used. The Andriod based software application program for Bluetooth and Wi-Fi communication in the proposed system are explained below.

a. Bluetooth Terminal

Bluetooth Terminal is an Android application program that enables the Android PDA's to communicate simply with a Bluetooth device via a terminal. Bluetooth Terminal application program therefore enables the Android PDA to transmit (or receive) the messages in either hexadecimal (hex) or string format to (and from) the connected Bluetooth devices. At the receiver end, the HC-05 module is interfaced with microcontroller that is programmed to store the received message and display that to the LCD screen.

b. Wi-Fi keyboard

Wi-Fi keyboard application program for Android the enables the Android based PDA's to send the string to the Wi-Fi device. At the receiver end of the developed system, the Wi-Fi transceiver module (ESP 8266) communicates with Wi-Fi keyboard application program installed on Android PDA via Wi-Fi network. ESP 8266 module is interfaced with microcontroller that is programmed to store the received message and display that to the LCD screen.

IV. HARDWARE IMPLEMENTATION

The microcontroller board (Arduino UNO) is programmed in a manner that on its correct initializing with LCD and transceiver module, welcome message will be displayed on LCD. The user selected communication mode (Bluetooth mode or Wi-Fi mode) is also displayed on the LCD screen as the corresponding transceiver is connected. Every Bluetooth device has their unique Media Access Control address (MAC) address. MAC address is a unique identifier assigned to network interfaces for communications on the physical network segment. The interfacing of Android based PDA with wireless notice board in Bluetooth communication mode using Bluetooth transceiver HC-05 is shown in Fig. 2.

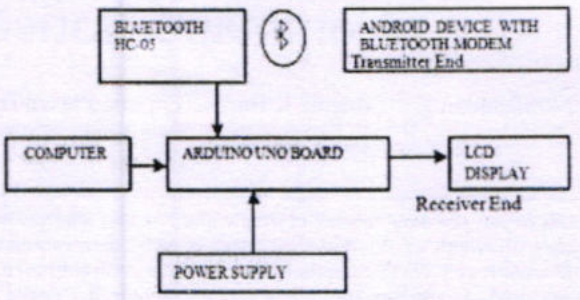

Fig. 2. Bluetooth Communication for Android based Wireless Notice Board

Android based wireless notice board interfaced in Wi -Fi communication mode using Wi-Fi transceiver ESP 8266 is shown in Fig. 3.

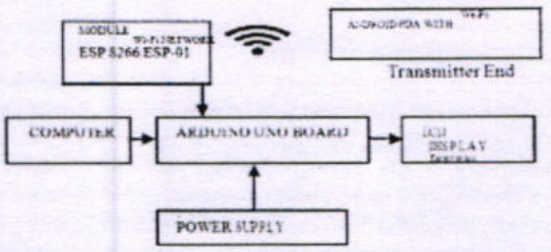

Fig. 3. Wi-Fi Communication for Android based Wireless Notice Board

V. SYSTEM IMPLEMENTATION

Using the developed system, two different applications of displaying messages on a remote digital notice board and wireless staff/person calling has been implemented and described below.

1. Android based Wireless Notice Board using Bluetooth communication

Using the Bluetooth interface a Personal Area Networks (PANs) has been created in the range between 10-15 meters. Bluetooth uses the 2.45 GHz frequency band for connection. A HC-05 Bluetooth module has been interfaced with the microcontroller board (Arduino UNO) using serial communication. The module's Media Access Control address is used by Android application program (Bluetooth Terminal) which allows only this device to communicate with the smartphone for controlling the external devices. The interconnection of Android PDA with the external Bluetooth devices like HC-05 Bluetooth module, using Bluetooth terminal for transmitting or receiving the

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data in form of hex or string. Using the android based wireless notice board in Bluetooth communication mode the user can send the alphanumeric text message instantly once the connection is established between Android based PDA and Bluetooth device (HC-05). The notice on the LCD display can be changed at any time by resending the new message from PDA using android application program that is Bluetooth technology. The new message will overwrite the previous message making the system very simple and easy to use. The implementation of Android based wireless notice board using Bluetooth communication is shown in Fig. 4 below.

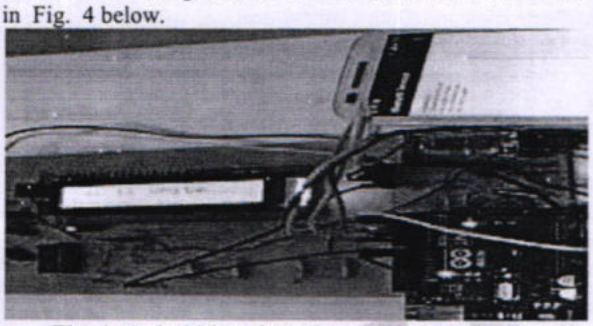

Fig. 4. Android based wireless notice board using Bluetooth communication

For communication in WI-Fi mode, ESP 8266 module is interfaced with microcontroller board that is programmed with AT commands to receive the user messages at an enhanced range of 200-250 meters from the Android PDA. By using the Wi-Fi communication technique, although the range of receiving messages on wireless notice board is improved but it adds to the system cost by requiring an additional power supply of 3.3 volts as the power taken by receiving a data packet is much more than the Bluetooth communication, so the system requires a tradeoff between more range and added cost. The complete system assembly for receiving the message from the Wi-Fi Keyboard at the Android based PDA is shown in Fig. 5.

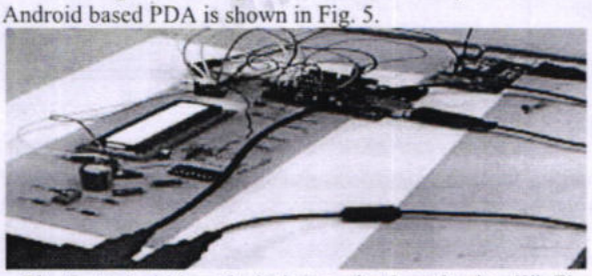

Fig. 5. Android based wireless notice board using Wi-Fi communication

The ESP 8266 module communicates with Wi-Fi keyboard application program installed on Android PDA via Wi-Fi network. The implementation of Android based wireless notice board using Wi-Fi communication for displaying different messages is shown in Fig. 6 below.

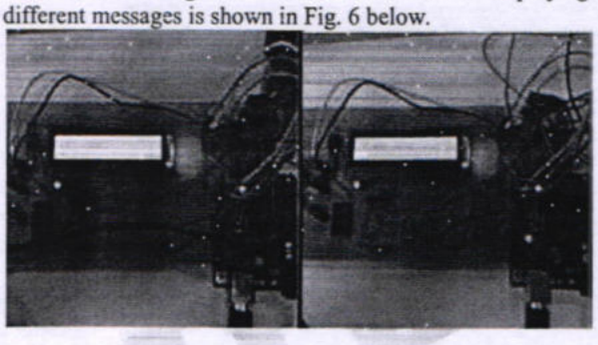

Fig. 6. Implementation of wireless notice board using Wi-Fi communication

2. Android based Person Calling system

Using the developed system, the nurse/office staff or person calling system has also been implemented by programming the microcontroller to get the specified key of the person. In the implementation mode if the received character key from the Android PDA matches with the stored character in the flash memory of microcontroller then the specific person will be called. The microcontroller is programmed to keep on checking the received serial data from Android PDA after every 30 seconds. For not receiving of any specified or stored character key a Known message of "Welcome to Amity" will be displayed. The wireless calling system in idle state is shown in Fig. 7.

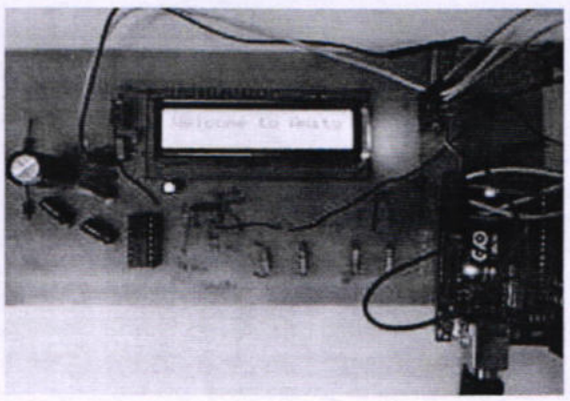

Fig. 7. Wireless Calling System in Idle state

On receiving a specified character key like "1", the microcontroller compares it with the stored key and displays the corresponding message for calling specific person on the LCD as shown in Fig. 8 and 9.

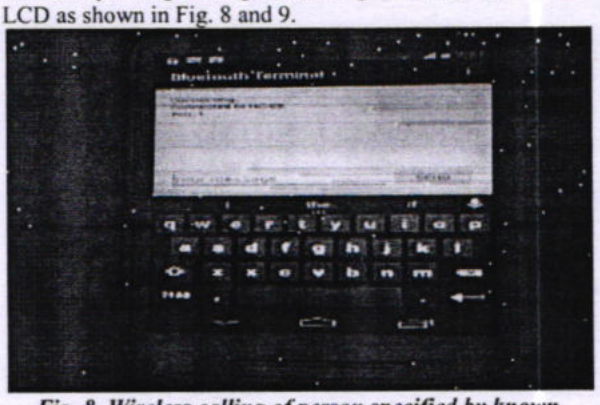

Fig. 8. Wireless calling of person specified by known character

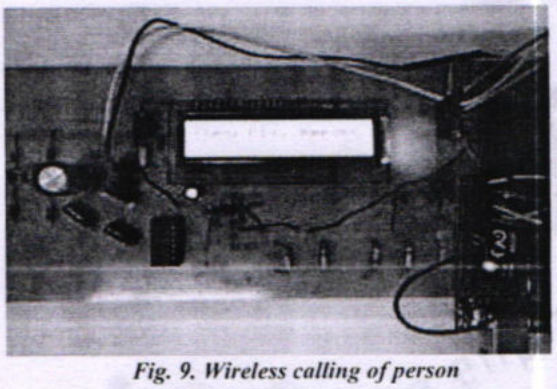

Fig. 9. Wireless calling of person

A visual alert is also generated by blinking of the LED for 1 minute using the inbuilt LED (Pin 13) of the Arduino UNO microcontroller board. The provision for audio alert using buzzer can also be added to the system at an added cost. Once the person has reported, to desired location the serial buffer register of microcontroller can be cleared by sending the specific character key and the system will get ready for receiving next character key.

VI. CONCLUSIONS AND FUTURE SCOPE

In this paper the technological advancement of the notice board is proposed that will help in saving time and resources and making the information available instantly to the intended person. The system is simple, low cost and easy to use that interacts with the intended users instantly. This system can be used in various applications like banking, schools, restaurants offices, hospitals, score boards for sports etc. The voice calling feature can be added with the proposed system as a further enhancement for using the system in railways, airport or bus stations.

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Android Application on Creating Awareness on Illegal Activities in Forest

R. Jyothi Sulochana, R. Bindhu, R. Hema and M. Lorate Shiny

Abstract--- *Smuggling of trees like sandal, "Sagwan" etc have created a highlight in many newspapers. There is scarcity of these trees in world thus are very costly. These are used in the medical sciences as well as cosmetics. Because of huge amount of money concerned in selling of such tree woods lots of incidents are happening of their smuggling In India and also in the jungles of Karnataka and Tamilnadu. To restrict such smuggling and to save the forests around the globe some preventive measures need to be implemented. We are developing such a system which can be used to restrict this illegal business. The suggested system will consist of three different modules as follows, A. Tree Unit, B. Area unit and C. Main Server Unit. Every tree will be outfitted with one small electronics unit which consists of Micro Controller,3 Sensors and RF module. There will be one sub server unit for fussy area of jungle*

Keywords--- *Android Phone, GSM Modem, LCD, Max 232 Microcontroller, Main and Sub Server Unit, RF Module, Sensors, Tree Unit.*

I. INTRODUCTION

We are on the rise such a system which can be used to restrict the illegal business of the trees which will stop the de-forestation to solve one of the issues with the Global Warming. The system consisting of three stages:

i. Tree unit
ii. Sub-server unit
iii. Main server unit

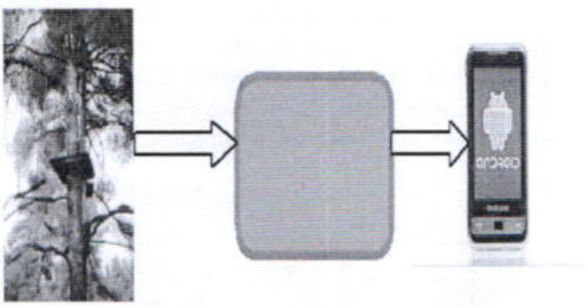

Figure 1.1

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DOI:10.9756/BIJSESC.8233

Tree Unit

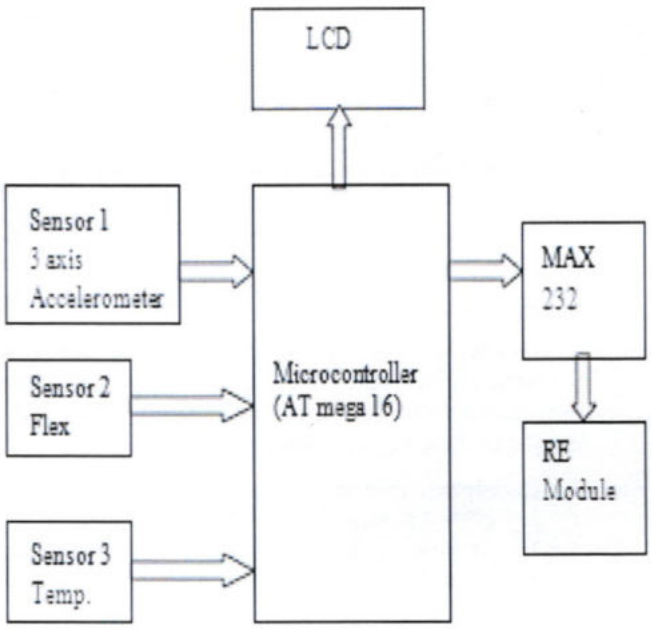

Figure 1.2: Tree Unit

The tree unit consists of three sensors:

a. 3 Axis Accelerometer Sensor
b. Flex Sensor
c. Temperature Sensor

The information to the micro-controller are sent by these sensors. To the tree unit which would be then transmitted to the next stage which is, Sub Server Unit, for further processing.

Sub Server Unit

This is the 2nd stage of the system which would be responsible for gathering and facilitating the data to the Main-Server Unit.

The Sub server unit is in charge to host the information from multiple Tree Units.

Thus in the real time scenario we can categorize multiple Sub-Server Units as one 1 Sub-Server Unit for every few Kilometers.

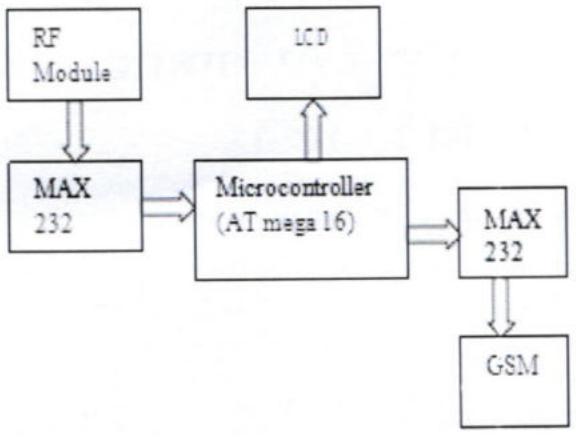

Figure 1.3: Sub Sever Unit

The Sub-Server unit contains RF module, Max 232 and the Micro-Controller which are responsible for the data transmission from Primary stage to the Final Stage of the Project.

Main Server Unit

This is the Final Stage of the system which is in command intended for the user interface and displaying the data that was transmitted from the step 1 and step 2. Main server would consist of these multiple things:

1. Storage Device
2. GSM Modem
3. Micro-Controller
4. An android Device.

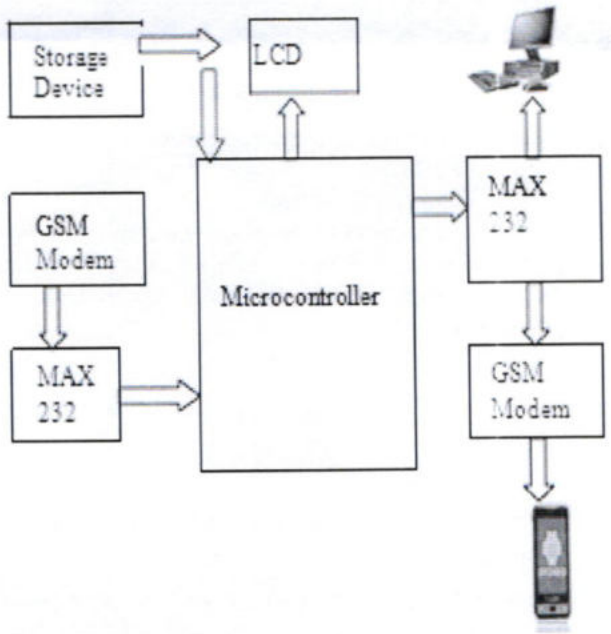

Figure 1.4: Main Sever Unit

The GSM modem would be fetching the data from the Micro-Controller and driven it to the Max232 which would have the configuration to send the data to machine Device. If the machine device is not easy to get the same which would be redirected to the configured System.

II. System Setup

A. Three s Axis Accelerometer

An accelerometer is an electromechanical device which measures the speeding up forces. These forces may be stationary like the constant force of gravity pulling at our feet, or they could be energetic - caused by moving or vibrating the accelerometer. Hypothetically an accelerometer behaves as a damped mass on a spring. When the accelerometer experiences an speeding up the mass is displaced to the point that the spring is able to accelerate the mass at the same rate as the casing. The dislocation is then measured to give the acceleration

Here MEMS 3 axis accelerometer is used. which consists of a accumulation at the sensor's chip, which is balanced by 4 beams doped with piezo resistive substance When the sensor is subjected to acceleration instant of gathering causes the 4 beams to cave in and so change the resistance in piezo substance which enables the sensor to detect the acceleration action

Fujitsu's small and highly aware accelerometer are used to detect acceleration inclination and vibration by measuring the motion in the X-, Y-, and Z-axis concurrently

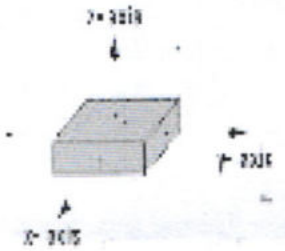

Figure 2.1: Principle of Detection

B. Flex Sensor

Flex sensors are inactive resistive devices that can are used to identify flexing or bending. Flex sensors are sensors that change in resistance depending upon the quantity of bend on the sensor which is contained by the flex sensor constitute carbon resistive elements, within a thin elastic substrate, boost the content of carbon decreases resistance. The flex sensor implemented here is a one-directional flex sensor that decreases its resistance in proportion.

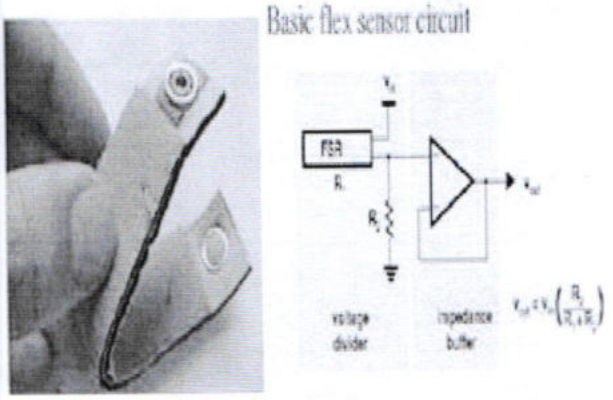

Figure 2.2: Flex Sensor

C. Temperature Sensor

Temperature sensor are used to sense the disaster of fire and hence to save the trees from getting blistered due to fire. Temperature sensor used is LM 35.

The LM35 sequences are precision integrated-circuit temperature sensors, whose output voltage is linearly related to the Celsius temperature. The LM35 thus has an advantage in excess of linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain suitable Centigrade scaling.

D. Android Phone

An android phone is a cell phone that uses the Google urbanized Android operating system and stage. The phone is Linux kernel-based, has functions that are written in the Java language and can still run applications written in the C language. Google united with the High Tech Computer Corporation (HTCC) to construct hardware for the G1 cell phone, which was the first to run the Android platform.

III. Data Processing

A. Data Transmission

3 axis accelerometer is used to sense motion of tree in all three coordinates x, y and z. Flex sensor is used to detect angle Temperature sensor is used for protection in case of fire. All three signals are given to microcontroller AT mega16. Output of AT mega 16 is provided to Max 232. If the tree is getting cut or if there is misfortune of fire, then these 3 sensors will give signal to microcontroller AT mega 16. There is no need of ADC in between sensors and microcontroller because AT mega 16 has inherent ADC. Max 232 gives that signal to RF module. At sub server unit signals are accepted through RF module again.Received signals are given to microcontroller all the way through max232. Output signal from microcontroller is given to GSM through max 232 again and then this signal is transmitted to main server unit.

Sub server unit is used connecting tree unit and main server unit because if tree is getting collapsed then tree unit will be offended but we will have the data in sub server unit, which tree is getting collapsed, exactly which place etc.

B. Data Reception

Storage device could be a server with multiple storage drives or a disk capacity Signals from sub server unit are received here. Level converter max 232 gives the received signal to microcontroller. Microcontroller gives that signal to PC through

Max232.we can directly have the received data on smart phone all the way through GSM.

IV. Conclusion

In this paper, we have proposed an application in android to create an awareness of smuggling trees in forest. We performed an experiment to determine the extent to which these type of smuggling can be automatically detected from data processing. The experiment shows that our approach outperforms the audit strategy of ANTI SMUGGLING of trees. Therefore we conclude that our approach is a substantial improvement over these illegal activities.

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An Effective And Reliable Data Routing Using Aggregation Technique In WSN

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Abstract: -- **Of Wireless Sensor Networks (WSNs) is used in many applications for precise monitoring. These networks contain high density nodes which lead to redundant data while sensing an event. The key issue in WSNs is energy conservation. Data fusion and aggregation is utilized to save energy. The size and number of exchanged messages is reduced by aggregating the redundant data at intermediate nodes. This will decrease energy consumption and communication costs. In this work, a novel DRINA (Data Routing for In-Network Aggregation) is proposed. It contains some key aspects like depleted number of messages for setting up a routing tree, maximized number of super-imposed routes, high aggregation rate, and reliable data aggregation and transmission. The proposed DRINA algorithm is compared with two other known interpretations: the Information Fusion-based Role Assignment (In FRA) and Shortest Path Tree (SPT) algorithms. The outcome of the system clearly denote that the routing tree built by DRINA yield the best aggregation quality in contrast to other algorithms in unconventional situations and in different key aspects required by WSNs.**

Keywords: - **Routing protocol, in-network aggregation, wireless sensor networks**

I. INTRODUCTION

Wireless sensor networks (WSNs) consists of spatially distributed autonomous devices that cooperatively sense physical or environmental conditions such as temperature, sound, vibration, motion, pressure, or pollutants at different locations. Due to high density of nodes, it is likely that redundant data will be detected by nearby nodes while sensing an event. Since energy conservation is a key issue in WSNs, data fusion and aggregation is exploited to save energy. Redundant data is aggregated at intermediate nodes, reducing the size and data of exchanged messages, thus reducing the communication cost and energy consumption.

A.Applications of WSNS

WSN is deployed in different classes of applications for accurate communication and manufacturing. A wireless sensor network (WSN) extends our capability to explore, monitor and control the physical world. It is especially useful in catastrophic or emergency scenario where human participation may be too dangerous. Data logging is done in WSN. Wireless sensor networks are also used for the collection of data for monitoring of environmental information, this can be as simple as the monitoring of the temperature in a fridge to the level of water in overflow tanks in nuclear power plants. The statistical information can then be used to show how systems have been working. The advantage of WSNs over conventional loggers is the "live" data feed that is possible.

B. Classification of Routing Protocols In WSN

Routing Protocol is used to find valid routes between communicating nodes. It is an autonomous collection of network users that communicate relatively over bandwidth constraint wireless link. The design space for routing algorithm for WSN is quite large and we can classify the routing algorithms in many ways. The routing protocols could be broadly classified as follows:

- ***Node centric Routing Protocols***

In node centric routing protocol the destination is specified based on the numerical addresses as in identifiers of the nodes. But it is not commonly expected communication type.

- ***Data Centric Routing Protocols***

In data centric routing, the sink sends queries to certain region and waits for data from the sensor located

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in the selected regions. Since the data is being requested through queries, attribute based naming is necessary to specify the properties data. Here data is usually transmitted from every sensor node within the deployment region with significant redundancy.

- ***Location Aware Routing Protocols***

The nodes know where they are in the geographical region in location aware routing protocol. Location information can be used to improve the performance in routing and provide new type of services.

- ***QoS based Routing Protocols***

In Qos based routing protocol, data delivery ratio, latency and energy consumption is mainly considered. To get a good quality of service, the routing protocol must possess more data delivery ratio, less latency and less energy consumption.

- ***Hierarchical Routing Protocols***

In hierarchical (cluster) protocol, different nodes are grouped to form clusters and data from nodes belonging to single cluster can be combined (aggregated). The cluster based approach has several advantages, like scalable, energy efficient in finding routes and easy to manage.

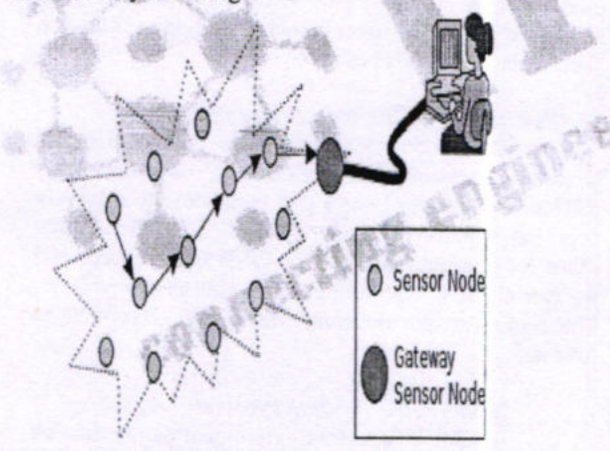

Fig1. Data aggregation aware routing, a key algorithm for data-driven WSNs.

II RELATED WORK

In [1], I.F. Akyildiz stated that the wireless sensor network consists of various sensor nodes which sense the environment and forward the sensed data to the sink node. Near the sink node all its energy is consumed which is hot-spot problem. Mobile sink is used, where a sink node is provided mobility which gathers information from the sensor nodes using 1-hop communication there by reducing a hot-spot problem and increases network lifetime and decreases energy consumption. A detailed comparison of surveyed routing protocols is also presented. In [2],

H.S. Abdel Salam used a network skeleton that is constructed immediately after network deployment and provides a topology that makes the network more tractable. The skeleton provides sensors with coarse localization information that enables them to associate their sensory data with the geographic location in which the data was measured. By hypothetically tiling the deployment area using identical hexagons, the construction algorithm clusters sensors into hexagons depending on the location. In [3],

L .Villa data will be aggregated while flowing from multiple sources to a specific node named sink. The construction of routing trees aware of the data aggregation has a considerable cost and solutions in the literature are not efficient for scenarios where the events are of short duration. This paper presents the Dynamic Data-Aggregation Aware Routing Protocol (DDAARP) for wireless sensor networks. It reduces the number of messages necessary to set up a routing tree, maximize the number of overlapping routes, selects routes with the highest aggregation rate, and performs reliable data aggregation transmission. In [4],

F. Huused an intelligent timer and some high-level knowledge of the network to implement an efficient aggregation timing control protocol. Our protocol aims to dynamically change the data aggregation period according to the aggregation quality. A request from the data sink will include the maximum latency for a certain number of reports. If this number of reports can be returned in less time than the maximum, then the maximum time will not be reached. In [5],

C. Efthymiou discussed the problem of energy-balanced data propagation in wireless sensor networks. The energy balance property guarantees that the average per sensor energy dissipation is the same for all sensors,

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during the entire execution of the protocol. The author precisely estimate the probabilities for propagation of data one-hop towards the final destination (the sink), or to send data directly to the sink. This randomized choice balances the (cheap) one-hop transmissions. In [6],

I. Chatzigiannakis has done the research on smart dust from a basic algorithmic point of view. "Sleep-Awake" protocol is used for information propagation that explicitly uses the energy saving features (i.e. the alteration of sleeping and awake time periods) of the smart dust particles. It is noted that the study of the interplay of these parameters allows us to program the smart dust network characteristics accordingly. In [7],

O. Youn is high light the challenges in clustering a WSN, discuss the design rationale of the different clustering approaches, and classify the proposed approaches based on their objectives and design principles. The author further discusses several key issues that affect the practical deployment of clustering techniques in sensor network applications.

III AN EFFICIENT & RELIABLE ROUTING USING DATA FUSION AND AGGREGATION TECHNIQUE (DRINA)

DRINA algorithm is used for better simulation results. As a result of implementing DRINA best aggregation quality is achieved. It maximizes the number of overlapping routes, high aggregation rate, reliable data aggregation and transmission. It reduces the number of messages for setting up a routing tree. In this work, a novel Data Routing for In-Network Aggregation, called DRINA is proposed. The main goal of our proposed DRINA Algorithm is to build a routing tree with the shortest paths that connect all source nodes to the sink while maximizing data aggregation.

The DRINA algorithm can be divided into three phases. In Phase 1, the hop tree from the sensor nodes to the sink node is built. In this phase, the sink node starts building the hop tree that will be used by Coordinators for data forwarding purposes. Phase 2 consists of cluster formation and cluster-head election among the nodes that detected the occurrence of a new event in the network. Finally, Phase 3 is responsible for both setting up a new route for the reliable delivering of packets and updating the hop tree.

A. Node functionalities

The proposed system considers the following roles in the routing infrastructure creation:

- Collaborator: A node that detects an event and reports the gathered data to a coordinator node.
- Coordinator : A node that also detects an event and is responsible for gathering all the gathered data sent by collaborator nodes, aggregating them and sending the result toward the sink node.
- Sink: A node interested in receiving data from a set of coordinator and collaborator nodes.
- Relay : A node that forwards data toward the sink.

Fig2. High level diagram for event occurrence

IV EXPERIMENTAL DESIGN

The main goal of our proposed system is to build a best routing path with the energy efficient paths that connect all source nodes to the sink while maximizing data aggregation when Multiple Group event occurred in a network. To achieve this, this system need a group of network nodes with unique identity and location details and node functionalities. This module helps to build such group of network node and these details are maintained in a separate table. When user press the show node button, all the details are fetched from the table and converted into graphical format and visualized it to the user.

Fig 3.Example of establishing new routes and updating the hop tree.

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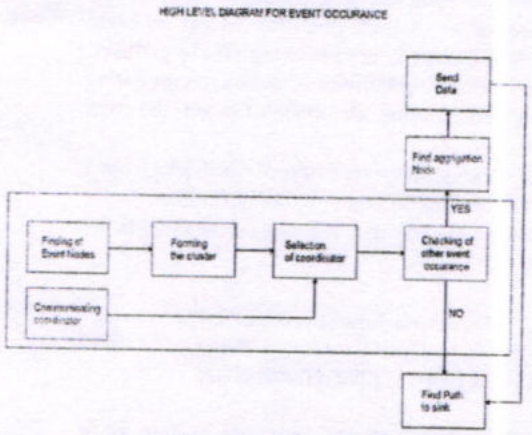
IV CONCLUSION

DRINA routing infra-structure tends to maximize the aggregation points and use fewer control packets to build the routing tree. DRINA does not flood a message to the whole network whenever a new event occurs. It has some key aspects required by WSNs aggregation aware routing algorithmssuch as a reduced number of



messages for setting up a routing tree, maximized number of overlapping routes, high aggregation rate, and reliable data aggregation and transmission. The obtained results clearly show that DRINA outperformed the other algorithms for all evaluated scenarios.

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Agrikart: A New Revolution Agriculture

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Abstract— **The project is based upon Wireless Sensor Network and an android based interface. The advanced development in wireless sensor networks can be used in monitoring various parameters in agriculture. Due to uneven natural distribution of rain water, it is very difficult for the farmers to monitor and control the distribution of water to agricultural field as per the requirements of the crop. There is no ideal irrigation method for all weather conditions, soil structure and variety of crop cultures. The sensors are used to collect various data which is to be then analyzed. The android interface provides the farmer with a framework to communicate with experts and get immediate response. It also provides them detailed information about the governmental policies which they can make use of. The main motive of this idea is to provide the analyzed soil sample and the best suggestion on which crop will minimize the cost and maximize the profit. The application also gives specific weather predictions for the day/week. Details on agricultural loans with their interest rates are also shown in the android application interface. This project aims to reduce the stress and problems that adversely affect the farmers resulting in the loss of crops and human lives.**

KEYWORDS:**Agriculture, Irrigation, GSM, Android Application.**

I. INTRODUCTION

Global environmental changes are currently altering key ecosystem services that soils provide. Therefore, it is necessary to have up to date soil information on local, regional and global scales to monitor the state of soils and ensure that these ecosystem services continue to be provided. In this context, digital soil mapping (DSM) aims to provide and advance methods for data collection and analysis tailored towards detailed large-scale mapping and monitoring of soil properties. In particular, remote and proximal sensing methodologies hold considerable potential to facilitate soil mapping at larger temporal and spatial scales as feasible with conventional soil mapping methods. Existing remote and proximal sensing methods support three main components in DSM: (1) Remote sensing data support the segmentation of the landscape into homogeneous soil-landscape units whose soil composition can be determined by sampling. (2) Remote and proximal sensing methods allow for inference of soil properties using physically-based and empirical methods. (3) Remote sensing data supports spatial interpolation of sparsely sampled soil property data as a primary or secondary data source overall, remote and proximal sensed data are an important and essential source for DSM as they provide valuable data for soil mapping in a time and cost efficient manner.

This document provides general insights into diverse aspects of soil related remote sensing, including DSM, remote sensing technologies and soil properties. In this context, we present the underlying concept of DSM and introduce approaches to predict the spatial distribution of soil properties. Monitoring agricultural environment for various factors such as soil moisture, temperature and humidity along with other factors can be of significance. A traditional approach to measure these factors in an agricultural environment meant individuals manually taking measurementsand checking them at various times. As the smart phones users in INDIA are increasing and as the country is moving towards digitalization, our android based application can be at service for many farmer and thus helping them move towards the digital world. It can provide the necessary soil and crops related information for better productivity.

II. OBJECTIVE

AGRIKART is an android based application interface that is useful throughout all the stages of agriculture. The main objective of this project is to bring a new revolution in agriculture with technology. The project deals with the irrigation methods, soil samples, weather conditions and agricultural loans using wireless sensor networks.

III. AIM

This project aims to reduce the stress and problems that affect farmer and their crops which ultimately result in loss of crops and lives.

IV. LITERATURE SURVEY

1.Wireless Monitoring of Soil Moisture, Temperature & Humidity Using Zigbee in Agriculture

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Author: Prof C. H. Chavan, Mr.P. V.Karande[2014]

Zigbee-based agriculture monitoring system serves as a reliable and efficient system for monitoring agricultural parameters. The corrective action can be taken. Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is cheaper in cost and consumes less power. The GDP per capita in agro sector can be increased. This project can be extended for cattle monitoring. We have designed ZigBee wireless sensor network for monitoring the crop field area by deploying moisture sensors in the land to detect the places where the water level is low. From those results we can irrigate to that particular place only. So we can conserve water and minimize the problem of water logging in the land.

2.Monitoring for Precision Agriculture using Wireless Sensor Network-A Review

Author: AnjumAwasthi& S.R.N Reddy[2013].This paper explores the potential of WSN in the area of agriculture in India. Aiming at the sugarcane crop, a multi-parameter monitoring system is designed based on low-power ZigBee wireless communication technology for system automation and monitoring. Real time data is collected by wireless sensor nodes and transmitted to base station using zigbee. Data is received, saved and displayed at base station to achieve soil temperature, soil moisture and humidity monitoring. The data is continuously monitored at base station and if it exceeds the desired limit, a message is sent to farmer on mobile through GSM network for controlling actions. The implementation of system software and hardware are given, including the design of wireless node and the implementation principle of data transmission and communication modules. This system overcomes the limitations of wired

sensor networks and has the advantage of flexible networking for monitoring equipment, convenient installation and removing of equipment, low cost and reliable nodes and high capacity.

3. A Test-bed on Real-time Monitoring of Agricultural Parameters using Wireless Sensor Networks for Precision Agriculture

Author: SiuliRoy ,SomprakashBandyopadhyay[2015]

A sensing system combined with IEEE 802.15.4/Zigbee based wireless networking [8] has been tested to be quite effective. We have observed that wireless transmission range varies with humidity and environment condition. On that basis we have to design the placement of routers in a network. If possible then number of routers should be increased. The routers should be encased in such a way that it can tolerate sudden weather damage like rain falling, storm etc. To use this system in a crop field or in other greenhouses, the Maxstream-Pro with whip antenna is recommended for routers. The whip antenna rarely varies in case of range. It is very difficult for a router placed in ground level to send data to another router which is placed in 2nd or 3rd floor of a building. So in that case both the router should be elevated somehow to be in line of sight.

4. A Zigbee Based Smart Sensing Platform for Environmental Monitoring

Author : Mane S.P. , Kavathekar G.S. , Jadhav S.T.

In this paper we proposed an environmental monitoring system with a Star network structure controlled by a central station. The different stations are equipped with temperature, relative humidity, sunlight and Wind Speed sensors. Initial component testing of sensor performance has reflected good results in sensing and radio communication. The outcome provides a variable platform for different sensors to measure necessary values. In future we can add GSM module at coordinate side of developed system to get records on Mobile phones.

5.Zigbee based Wireless Sensing Platform for Monitoring Agriculture Environment

Author: N.Krishna Chaitanya.

Sensors and ZigBee are interfaced to microcontroller. The sensed parameters are displayed on LCD display. The received parameters are continuously displayed on graphical user interface and the data and time of each value is stored in system database, the below table II shows the results stored in Micro Soft Access Database. Hence, the project agriculture monitoring is designed and developed using ARM. The developed system is successful in measuring the dryness of the soil, relative humidity and temperature. The values received are stored in system database are used for further analysis.

V. EXISTING SYSTEM

Over the past decades, the Earth's surface has witnessed major changes in land use and land cover. These changes are likely to continue, driven by demographic pressure and by climate change. As part of the Earth's spheres, the pedosphere is responding and contributing to

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these environmental changes. Observed changes in the functioning of the pedosphere renewed the recognition that soil resources provide key ecosystem services and play a fundamental role for assuring food security. In this context, monitoring tools are needed for maintaining a sustainable ecological status and improving soil conservation. The implementation of sustainable agricultural, hydrological, and environmental management requires an improved understanding of the soil, at increasingly higher resolutions. Information on spatial and temporal variations in soil properties are required for use in conservations efforts, climate and ecosystem modeling, as well as engineering, agricultural, forestry applications, erosion and runoff simulations. Irrigation of plants is usually a very time consuming activity; to be done in a reasonable amount of time, it requires a large amount human resources. Some systems use technology to reduce the number of workers or the time required to water the plants. With such systems the control is very limited and many resources are still wasted. Water is one of these resources that are used excessively. Mass irrigation is one method used to water the plants. This method has massive loss since the amount of water given in excess of the plant needs. There are also many miss conceptions as to cultivate what type of crops in what type of cultivation lands available.

VI. DRAWBACKS

- Farmers are not aware of the changes in the soil due to the environmental changes.
- To transfer the knowledge to the farmers is difficult.

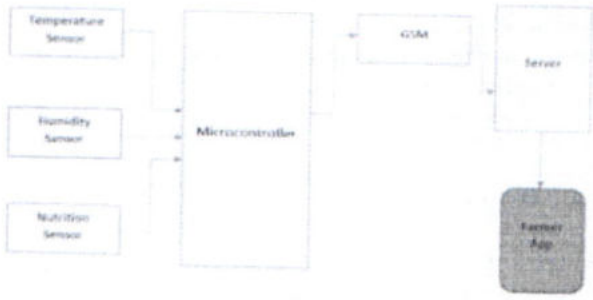
VII. PROPOSED SYSTEM

The proposed hardware of this system includes 8 bit AVR, GSM module, Temperature, humidity, soil moisture sensors and soil ingredients sensors, LCD. The system is low cost & low power consuming so that anybody can afford it. The data monitored is collected at the server. It can be used in precision farming. The system should be designed in such a way that even illiterate villagers can operate it. They themselves can check different parameters of the soil like salinity, acidity, moisture etc. from time to time. During irrigation period they have to monitor their distant pump house throughout the night as the electricity supply is not consistent. The system can be installed at the pump house located remotely from the village, it is interfaced with the pump starter & sensors are plugged at different location in the field for data acquisition. Using this system they can switch on their pump from their home whenever they want. To overcome the shortcomings of the existing system we are planning to implement wireless sensor network with which the data about the soil is collected and then sent to the farmer via an android application interface. The android application interface also provides specific weather predictions for the rest of the week which help the farmer to plan accordingly and to manage his vital resources. The app also provides complete details on agricultural loans, their interest rates of many nationalized banks across the country helping the farmer choose the best in the lot and also gives the Governmental policies available across the country.

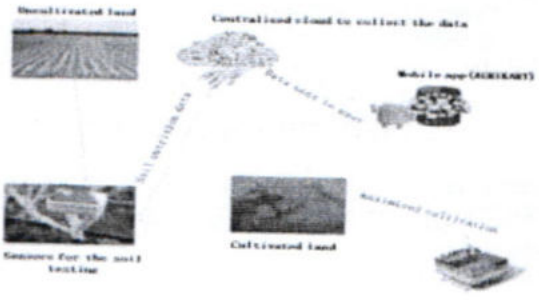
VIII. ADVANTAGES

- Real time data is transferred to the farmers.
- Better productivity.
- Good quality of corps.
- Easy for farmers.
- Farmersget the tips and genuine suppliers details in the app.
- Audio alert and notification.

IX. THE BLOCK DIAGRAM



X.WORKING PRINCIPLE



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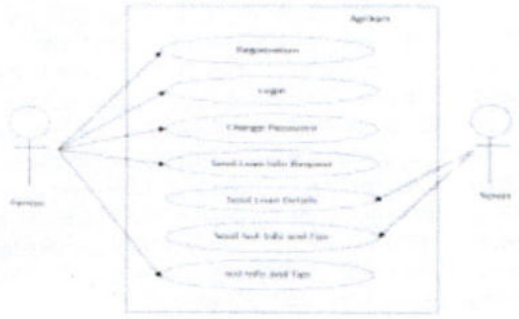
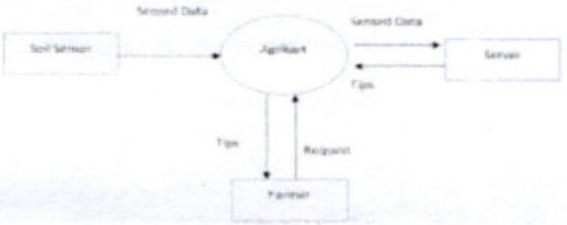
XI. USE CASE DIAGRAM



XII. DATA FLOW DIAGRAM



XIII.HARDWARE REQUIREMENTS

Processor : Intel i3
Ram : 2GB
SPEED : 2.4 Ghz
Android Phone
Microcontroller- ATMEGA 8/ ATMEGA 16
Temperature Sensor
Humidity Sensor
Nutrition Sensor
Beeper
GSM Sim 900

Power Supply
i. Transformer
ii. Diode
iii. Resister
iv. Capacitor
v. LED

XIV. SOFTWARE REQUIREMENT

1. AVR Studio
2. Embedded C
3. Java
4. Android Studio
5. Mysql
6. Netbeans

XV.CONCLUSION

Sensor-based agriculture monitoring system serves as a reliable and efficient system for monitoring agricultural parameters. The corrective action can be taken. Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is cheaper in cost and consumes less power. The GDP per capita in agro sector can be increased. This project can be extended for cattle monitoring. This Idea aims to provide an optimized and a well-structured framework to the farmer which helps the farmer both mentally and financially for better results. This idea also helps in maximized optimization of all the vital resources.

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A Survey of Routing Protocols in Mobile Ad Hoc Networks

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Abstract— **Mobile Ad Hoc Network (MANET) is collection of multi-hop wireless mobile nodes that communicate with each other without centralized control or established infrastructure. The wireless links in this network are highly error prone and can go down frequently due to mobility of nodes, interference and less infrastructure. Therefore, routing in MANET is a critical task due to highly dynamic environment. In recent years, several routing protocols have been proposed for mobile ad hoc networks and prominent among them are DSR, AODV and TORA. This research paper provides an overview of these protocols by presenting their characteristics, functionality, benefits and limitations and then makes their comparative analysis so to analyze their performance. The objective is to make observations about how the performance of these protocols can be improved.**

Index Terms—**AODV, DSR, MANET, TORA**

I. INTRODUCTION

The wireless network can be classified into two types: Infrastructured or Infrastructure less. In Infrastructured wireless networks, the mobile node can move while communicating, the base stations are fixed and as the node goes out of the range of a base station, it gets into the range of another base station. The fig. 1, given below, depicts the Infrastructured wireless network.

In Infrastructureless or Ad Hoc wireless network, the mobile node can move while communicating, there are no fixed base stations and all the nodes in the network act as routers. The mobile nodes in the Ad Hoc network dynamically establish routing among themselves to form their own network 'on the fly'. This type of network can be shown as in fig. 2.

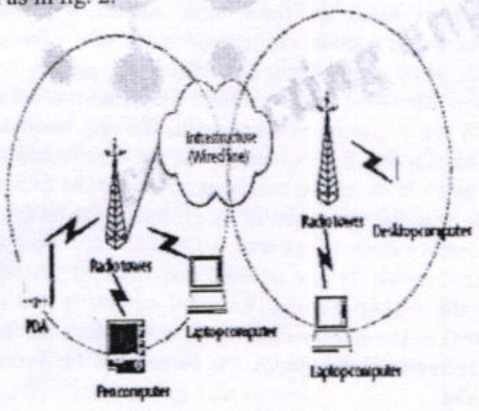

Fig. 1: Infrastructured Wireless Networks

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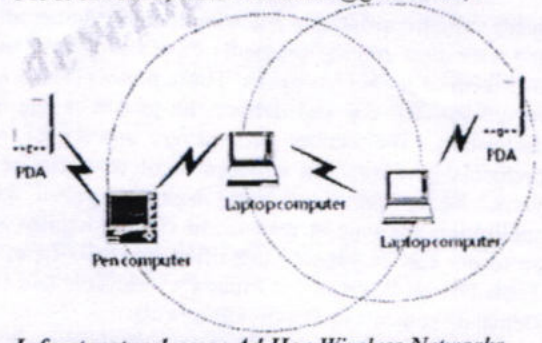

Fig. 2: Infrastructureless or Ad Hoc Wireless Networks

A Mobile Ad Hoc Network (MANET) is a collection of wireless mobile nodes forming a temporary/short-lived network without any fixed infrastructure where all nodes are free to move about arbitrarily and where all the nodes configure themselves. In MANET, each node acts both as a router and as a host & even the topology of network may also change rapidly. Some of the challenges in MANET include:

1) Unicast routing
2) Multicast routing
3) Dynamic network topology
4) Speed

5) Frequency of updates or Network overhead
6) Scalability
7) Mobile agent based routing
8) Quality of Service
9) Energy efficient/Power aware routing
10) Secure routing

The key challenges faced at different layers of MANET are shown in Fig. 3. It represents layered structure and approach to ad hoc networks.

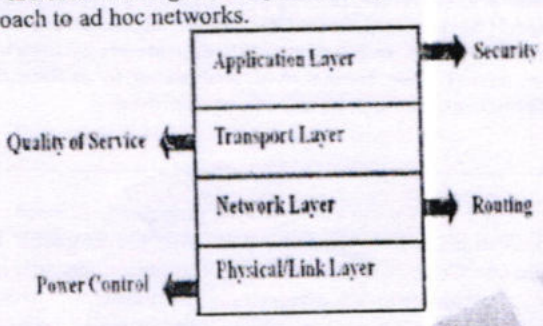

Fig.3: MANET Challenges

II. ROUTING PROTOCOLS

A routing protocol is needed whenever a packet needs to be transmitted to a destination via number of nodes and numerous routing protocols have been proposed for such kind of ad hoc networks. These protocols find a route for packet delivery and deliver the packet to the correct destination. The studies on various aspects of routing protocols have been an active area of research for many years. Many protocols have been suggested keeping application and type of network in view. Basically, routing protocols can be broadly classified into two types as (a) Table Driven Protocols or Proactive Protocols and (b) On-Demand Protocols or Reactive Protocols

Table Driven or Proactive Protocols: In Table Driven routing protocols each node maintains one or more tables containing routing information to every other node in the network. All nodes keep on updating these tables to maintain latest view of the network. Some of the existing table driven or proactive protocols are: DSDV [6], [19], DBF [7], GSR [24], WRP [23] and ZRP [28], [13].

On Demand or Reactive Protocols: In these protocols, routes are created as and when required. When a transmission occurs from source to destination, it invokes the route discovery procedure. The route remains valid till destination is achieved or until the route is no longer needed. Some of the existing on demand routing protocols are: DSR [8], [9], AODV [4], [5] and TORA [26], [27].

The emphasis in this research paper is concentrated on the survey and comparison of various On Demand/Reactive Protocols such as DSR, AODV and TORA as these are best suited for Ad Hoc Networks. The next sub-section describes the basic features of these protocols.

III.DYNAMIC SOURCE ROUTING [8, 9]

Dynamic Source Routing (DSR) is an Ad Hoc routing protocol which is based on the theory of source-based routing rather than table-based. This protocol is source-initiated rather than hop-by-hop. This is particularly designed for use in multi hop wireless ad hoc networks of mobile nodes. Basically, DSR protocol does not need any existing network infrastructure or administration and this allows the Network to be completely self-organizing and self-configuring. This Protocol is composed of two essential parts of route discovery and route maintenance. Every node maintains a cache to store recently discovered paths. When a node desires to send a packet to some node, it first checks its entry in the cache. If it is there, then it uses that path to transmit the packet and also attach its source address on the packet. If it is not there in the cache or the entry in cache is expired (because of long time idle), the sender broadcasts a route request packet to all of its neighbors asking for a path to the destination. The sender will be waiting till the route is discovered. During waiting time, the sender can perform other tasks such as sending/forwarding other packets. As the route request packet arrives to any of the nodes, they check from their neighbor or from their caches whether the destination asked is known or unknown. If route information is known, they send back a route reply packet to the destination otherwise they broadcast the same route request packet. When the route is discovered, the required packets will be transmitted by the sender on the discovered route. Also an entry in the cache will be inserted for the future use. The node will also maintain the age information of the entry so as to know whether the cache is fresh or not. When a data packet is received by any intermediate node, it first checks whether the packet is meant for itself or not. If it is meant for itself (i.e. the intermediate node is the destination), the packet is received otherwise the same will be forwarded using the

path attached on the data packet. Since in Ad hoc network, any link might fail anytime. Therefore, route maintenance process will constantly monitors and will also

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notify the nodes if there is any failure in the path. Consequently, the nodes will change the entries of their route cache.

Benefits and Limitations of DSR

One of the main benefit of DSR protocol is that there is no need to keep routing table so as to route a given data packet as the entire route is contained in the packet header. The limitations of DSR protocol is that this is not scalable to large networks and even requires significantly more processing resources than most other protocols. Basically, In order to obtain the routing information, each node must spend lot of time to process any control data it receives, even if it is not the intended recipient. The flowchart [17] for DSR Protocol is given below:

IV. ADOV (AD HOC ON DEMAND DISTANCE VECTOR) [4], [5]

AODV is a variation of Destination-Sequenced Distance-Vector (DSDV) routing protocol which is collectively based on DSDV and DSR. It aims to minimize the requirement of system-wide broadcasts to its extreme. It does not maintain routes from every node to every other node in the network rather they are discovered as and when needed & are maintained only as long as they are required.

The key steps of algorithm used by AODV for establishment of unicast routes are explained below.

A. Route Discovery

When a node wants to send a data packet to a destination node, the entries in route table are checked to ensure whether there is a current route to that destination node or not. If it is there, the data packet is forwarded to the appropriate next hop toward the destination. If it is not there, the route discovery process is initiated. AODV initiates a route discovery process using Route Request (RREQ) and Route Reply (RREP). The source node will create a RREQ packet containing its IP address, its current sequence number, the destination's IP address, the destination's last sequence number and broadcast ID. The broadcast ID is incremented each time the source node initiates RREQ. Basically, the sequence numbers are used to determine the timeliness of each data packet and the broadcast ID & the IP address together form a unique identifier for RREQ so as to uniquely identify each request. The requests are sent using RREQ message and the information in connection with creation of a route is sent back in RREP message. The source node broadcasts the RREQ packet to its neighbours and then sets a timer to wait for a reply. To process the RREQ, the node sets up a reverse route entry for the source node in its route table. This helps to know how to forward a RREP to the source. Basically a lifetime is associated with the reverse route entry and if this entry is not used within this lifetime, the route information is deleted. If the RREQ is lost during transmission, the source node is allowed to broadcast again using route discovery mechanism.

B. Expanding Ring Search Technique

The source node broadcasts the RREQ packet to its neighbours which in turn forwards the same to their neighbours and so forth. Especially, in case of large network, there is a need to control network-wide broadcasts of RREQ and to control the same; the source node uses an expanding ring search technique. In this technique, the source node sets the Time to Live (TTL) value of the RREQ to an initial start value. If there is no reply within the discovery period, the next RREQ is broadcasted with a TTL value increased by an increment value. The process of incrementing TTL value continues until a threshold value is reached, after which the RREQ is broadcasted across the entire network.

C. Setting up of Forward Path

When the destination node or an intermediate node with a route to the destination receives the RREQ, it creates the RREP and unicast the same towards the source node using the node from which it received the RREQ as the next hop. When RREP is routed back along the reverse path and received by an intermediate node, it sets up a forward path entry to the destination in its routing table. When the RREP reaches the source node, it means a route from source to the destination has been established and the source node can begin the data transmission.

D. Route Maintenance

A route discovered between a source node and destination node is maintained as long as needed by the source node. Since there is movement of nodes in mobile ad hoc network and if the source node moves during an active session, it can reinitiate route discovery mechanism to establish a new route to destination.

Conversely, if the destination node or some intermediate node moves, the node upstream of the break initiates Route Error (RERR) message to the affected active upstream neighbors/nodes. Consequently, these nodes propagate the RERR to their predecessor nodes. This process continues until the source node is reached. When RERR is received by the source node, it can either stop sending the data or reinitiate the route discovery mechanism by sending a new RREQ message if the route is still required.

E. Benefits and Limitations of AODV

The benefits of AODV protocol are that it favors the least congested route instead of the shortest route and it also supports both unicast and multicast packet transmissions even for nodes in constant movement. It also responds very quickly to the topological changes that affects the active routes. AODV does not put any additional overheads on data packets as it does not make use of source routing.

The limitation of AODV protocol is that it expects/requires that the nodes in the broadcast medium can detect each others' broadcasts. It is also possible that a valid route is expired and the determination of a reasonable expiry time is difficult. The reason behind this is that the nodes are mobile and their sending rates may differ widely and can change dynamically from node to node. In addition, as the size of network grows, various performance metrics begin decreasing. AODV is vulnerable to various kinds of attacks as it based on the assumption that all nodes must cooperate and without their cooperation no route can be established.

V. TORA (TEMPORARY ORDERED ROUTING PROTOCOL) [26], [27]

TORA is a distributed highly adaptive routing protocol designed to operate in a dynamic multihop network. TORA uses an arbitrary height parameter to determine the direction of link between any two nodes for a given destination. Consequently, multiple routes often exist for a given destination but none of them are necessarily the shortest route. To initiate a route, the node broadcasts a QUERY packet to its neighbors. This QUERY is rebroadcasted through the network until it reaches the destination or an intermediate node that has a route to the destination. The recipient of the QUERY packet then broadcasts the UPDATE packet which lists its height with respect to the destination. When this packet propagates in the network, each node that receives the UPDATE packet sets its height to a value greater than the height of the neighbour from which the UPDATE was received. This has the effect of creating a series of directed links from the original sender of the QUERY packet to the node that initially generated the UPDATE packet. When it was discovered by a node that the route to a destination is no longer valid, it will adjust its height so that it will be a local maximum with respect to its neighbours and then transmits an UPDATE packet. If the node has no neighbors of finite height with respect to the destination, then the node will attempt to discover a new route as described above. When a node detects a network partition, it will generate a CLEAR packet that results in reset of routing over the ad hoc network. The flowchart [17] for TORA Protocol is given below:

A. Benefits and Limitations of TORA

One of the benefits of TORA is that the multiple routes between any source destination pair are supported by this protocol. Therefore, failure or removal of any of the nodes is quickly resolved without source intervention by switching to an alternate route.

TORA is also not free from limitations. One of them is that it depends on synchronized clocks among nodes in the ad hoc network. The dependence of this protocol on intermediate lower layers for certain functionality presumes that the link status sensing, neighbor discovery, in order packet delivery and address resolution are all readily available. The solution is to run the Internet MANET Encapsulation Protocol at the layer immediately below TORA. This will make the overhead for this protocol difficult to separate from that imposed by the lower layer.

B.3 .0 Performance Metrics

There are number of qualitative and quantitative metrics that can be used to compare reactive routing protocols. Most of the existing routing protocols ensure the qualitative metrics. Therefore, the following different quantitative metrics have been considered to make the comparative study of these routing protocols through simulation.

1) Routing overhead: This metric describes how many routing packets for route discovery and route maintenance need to be sent so as to propagate the data packets.

2) Average Delay: This metric represents average end-to-end delay and indicates how long it took for a packet to travel from the source to the application layer of the destination. It is measured in seconds.

3) Throughput: This metric represents the total number of bits forwarded to higher layers per second. It is measured in bps. It can also be defined as the total amount of data a receiver actually receives from sender divided by the time taken by the receiver to obtain the last packet.

4) Media Access Delay: The time a node takes to access media for starting the packet transmission is called as media access delay. The delay is recorded for each packet when it is sent to the physical layer for the first time.

5) Packet Delivery Ratio: The ratio between the amount of incoming data packets and actually received data packets.

6) Path optimality: This metric can be defined as the difference between the path actually taken and the best possible path for a packet to reach its destination.

VI. CONCLUSION

In this research paper, an effort has been made to concentrate on the comparative study and performance analysis of various on demand/reactive routing protocols (DSR, AODV and TORA) on the basis of above mentioned performance metrics. The results after analysis have reflected in Table I and Table II. The first table is description of parameters selected with respect to low mobility and lower traffic. It has been observed that the performance of all protocols studied was almost stable in sparse medium with low traffic. TORA performs much better in packet delivery owing to selection of better routes using acyclic graph. Table II is evaluation of same parameters with increasing speed and providing more nodes. The results indicate that AODV keeps on improving with denser mediums and at faster speeds.

Table III is description of other important parameters that make a protocol robust and steady in most cases. The evaluation predicts that in spite of slightly more overhead in some cases DSR and AODV outperforms TORA in all cases. AODV is still better in Route updation and maintenance process.

It has been further concluded that due to the dynamically changing topology and infrastructure less, decentralized characteristics, security and power awareness is hard to achieve in mobile ad hoc networks. Hence, security and power awareness mechanisms should be built-in features for all sorts of applications based on ad hoc network. The focus of the study is on these issues in our future research work and effort will be made to propose a solution for routing in Ad Hoc networks by tackling these core issues of secure and power aware/energy efficient routing.

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A Futuristic Approach for Towerless Mobile Networks Contributing to Digital India

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***Abstract*— This project is an attempt to develop the mobile networks to have a wireless voice call happening without the help of the towers. Our main aim is to remove the towers in the communication process. The towers have been hazardous to many birds and animals. This project uses the Raspberry Pi boards with the inbuilt wi-fi on board. The Raspberry Pi with the wi-fi is used for the prototype, which would be used to develop a voice call application which would transfer the voice through the wifi communication. It is proposed to develop this technology to be able to access only till the distance of 30 meters which is the distance limit of the wi-fi communication. It would be possible to move this communication to be expanded by the use of the Wimax technology which would be able to communicate in the range of kilometers. This project uses two Raspberry Pi kits with Wi-fi inbuilt on it and would be able to communicate by developing the voice call application and would be able to use the audio jack on the kit. A hardware implementation would be developed and the results would be analyzed for performance.**

***Keywords*—Raspberry pi, IoT, Wi-Fi**

I. INTRODUCTION

The Raspberry Pi platform has gained wide popularity in the last few years because of its wide availability, ease to use and having excellent support and documentation, along with its low cost. The Raspberry Pi have mostly useful in the development of educational projects. It is capable of doing all those things such a PC can do, right from browsing the internet and playing high definition video, to make spreadsheets, wordprocessing. The processor of a Raspberry Pi system is a Broadcom BCM2835 system-onchip (SoC) multimedia processor. But it does not have internal memory so that the SD card is used for booting and storage. This uses Linux and Debian based operating systems. We are using "Raspbian Wheezy".

The model we are going to use is Raspberry Pi B+ model which has 4 USB ports, and HDMI port and a 10/100 Ethernet controller. It requires 5V, 1.2 Amp power supply with micro-USB connector. Taking the advantages of all features of raspberry pi live transmission of audio and video has been carried out with the help of VOIP protocol. Live chat on the raspberry pi nothing but to perform the audio transmission based on the ARM cortex V8 Raspberry Pi platform. Raspberry pi capable to perform the live audio & video streaming by using the gstreamer & gst-launch libraries. Live video streaming is done by connecting webcam to both the system & audio transmission by connecting speaker and USB mike to the system with keypad like old model mobile phones. It acts as the standalone system for the live audio data transmission without PC.

II. PROBLEM STATEMENT:

The higher usage of the tower in the communication has introduced lot of health hazards in the life of the human being and also there are many environmental issues like it uses more space for there would be a need to cut more trees. And in the same way it has disturbed lot of birds in the nearby areas and has made a big issue in the food cycle. Thus there is a immediate use of the towerless communication in the near future.

III HARDWARE REQUIREMENT:

Audio Jack: Regular available speakers are used for audio purpose.

USB camera: Easily available USB port camera is used for capturing image.

IEEE 802.11: This is IEEE standard used for the wireless Wi-Fi Network.

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VI. PROPOSED SYSTEM:

This project starts with the installation of LINUX operating system. After that we have to configure WI-FI Setting. Each device will have its own unique IP address. So we need to detect the IP address first and then connect. Next step is to connect the USB camera to the device .After configuring the camera configure USB headphones and also create WI- FI network ,if there is necessity one can create a password in order to secure the network. Install the IP address of Raspberry Pi kit. Install and configure VOIP and SIP protocol. At last connect a second user through VOIP and SIP. Same system arrangement is present to the second user. Raspberry pi does not have in built memory for storing operating system and software packages. so it is necessary to boot a SD with raspbian operating system. raspbian wheezy OS is downloaded from official website of Raspberry pi foundation. For transmission of audio and video from one raspberry pi to another raspberry pi configuration of USB headphone, USB camera. Wi-Fi network and GUI is desired.

A) Installation of the "Raspbian Wheezy" OS:

Raspbian is a Debian-derived free OS optimizing specially for the Raspberry Pi hardware. Raspbianmostlyuses a Linux kernel also popular as the Debian GNU/Linux distribution. It comes along with over 35,000 packages and pre- compiled software bundled in a format that is easy for installation on the Raspberry Pi. The "wheezy-raspbian.Zip"OS file can be directly downloaded from Raspberry Pi"s official website. After downloading this ZIP file it is necessary to extract the OS image file into the SD memory card. for that purpose an image writer application "win32diskimager- v0.9-binary"[2] can be used. This software is used to write a raw disk image to a removable memory device. It is a free of cost and the program for it is open source. It is useful for any embedded development because of the source code can be branched and modified as per the requirement. After writing to SD card is finished. it is put in the SD card slot of Raspberry Pi and switch it on so that initial booting of raspberry pi can start.[1]

B) Configuration of Audio jack and Mic:

The Raspberry Pi doesn't have socket for headphone. To record audio, it is necessary to use soundcard. Here we are using regular and easily available inexpensive speakers and mic for this purpose. For checking if Raspberry pi can read usb speakers and mouse , "lsusb" command is given in terminal window. This command displays all the devices those are connected to the respective USB ports. For speaker settings, ALSA (Advanced Linux Sound Architecture) is used. The ALSA provides audio and MIDI functionality to the Linux operating system. ALSA supports upto 8 sound cards. numbering from 0 to 7. each card is capable of input and output. Raspberry Pi image has already alsa-utils for sound. We can set up usb port by opening alsamixer GUI. We can set the desired settings there.

C) Wi-Fi configuration of Raspberry Pi:

The Raspberry Pi's network interface settings are configured according to desired Wi-Fi network.Wi-Fi connection with router present in the network.Mostly enterprise area and home networks connect to Wi-Fi network through gateway (router). These networks have certain settings and to connect them the Raspberry Pi must be configured accordingly. All the interfaces(local loop. Ethernet. Wi-Fi interfaces) are defined inside the network directory.

The static IP address assigned to the each Rraspberry Pi, the following configuration are used for matching the IP. Netmask and Gateway of the network.

allow-hotplug wlan0
iface wlan0 inet manual
address<desired static IP>
netmask<netmask used for that network>
gateway<router IP address of that
network>wpa-roam
/etc/wpa_supplicant/wpa_supplicant.conf.

V. PROGRAMMING IN PYTHON:

Python is a high-level language. This means that Python code is written in largely recognizable English. providing the Pi with commands in a manner that is quick to learn and easy to follow. This is in marked contrast to low-level languages. like assembler, which are closer to how the computer —thinks but almost impossible for a human to follow without experience. The high-level nature and clear syntax of Python make it a valuable tool for anyone who wants to learn to program. It is also the language that is recommended by the Raspberry Pi

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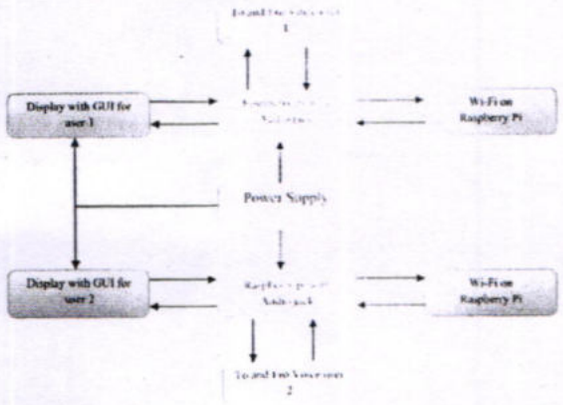
Foundation for those looking to progress from the simple Scratch to more hands-on programming. Python is published under an open-source license, and is freely available for operating systems like Linux, OS X and Windows computer systems. This cross-platform support means that software written using Python on the Pi can be used on computers running almost any other operating system as well except where the program makes use of Pi-specific hardware such as the GPIO Port.

VI. BLOCK DIAGRAM



VII CONCLUSION:

The above mentioned disadvantages can be overcomed using this eco friendly model by replacing towers gradually, thus contributing to Digital India in order to develop our country. Be wise Using "WHEEZY-PI"

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An Efficient Approach to Reduce Network Partitioning Using AMMNET

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Abstract: -- **Mobile Ad Hoc Networks (MANETs) are one of the most important and unique applications that enable users to communicate without any fixed network infrastructure. The self-configuring capability of nodes makes it more useful among military applications and crisis management. Though MANETs are very powerful, they suffer from a serious problem known as Network Partitioning. When a Network connection between any two groups of systems fails simultaneously, it results in network partitioning. To overcome this issue, a technique called Autonomous mobile mesh network (AMMNET) has been proposed. The mobile mesh nodes of AMMNETs are used to follow the clients in the application terrain. For larger application terrain, the mesh nodes are capable to adapt a network topology to support intergroup communication. For this a distributed client tracking solution has been implemented which results in dynamic topology adaptation for the mobile clients. AMMNET provides high throughput and packet delivery ratio when compared to other techniques.**

Keywords:-- **Mobile mesh networks, Dynamic topology deployment, Client tracking**

I. INTRODUCTION

Wireless technology has been one of the most developing technologies, and is playing a vital role in the lives of people throughout the world in recent years. Particularly mobile ad-hoc networks are used to communicate without the need of base station around the geographical location. The sharing of data and services with other devices can be adapted easily and the maintenance and replacement of devices are very much reliable in Mobile ad- hoc networks. Here nodes act as routers to transfer the data from source to the destination. Though the MANET has large number of features, it is mainly suffers from a serious problem called network partitioning. Due to this limitation of MANET, it is not desirable to be used in the mission critical applications.

To overcome this problem of MANET, a network named Autonomous Mobile Mesh Network has been developed. A mesh network uses network topology and all nodes cooperate for the distribution of data. It is a form of wireless ad hoc network and it often consists of mesh clients, mesh routers and gateways. MANETs and mesh networks are therefore closely related, but a MANET deals with problems introduced by the mobility of the nodes. When compared to the other standard wireless mesh networks, the mesh nodes in AMMNETs are in mobile platform. These mobile mesh nodes are capable to follow the clients in the application area and also support topology adaptation. In this way AMMNET makes the MANET robust.

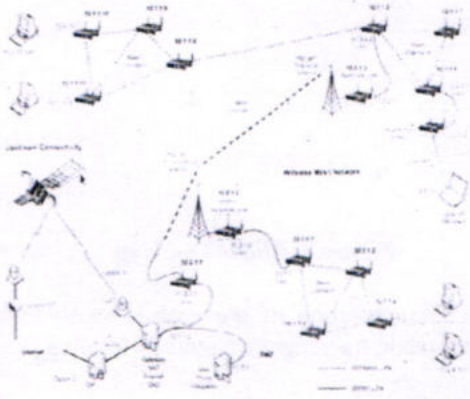

Figure.1. Configuration for a wireless mesh network

II.CLIENT TRACKING SYSTEM IN AMMNET

AMMNET is mainly based on mesh infrastructure and the nodes are mobile in nature. The

device is connected with a position capturing device such as GPS to track the clients in the application terrain. It is not necessary for the client to know about their location but it is necessary to send frequently their beacon messages. After receiving the beacon messages, the mesh nodes easily detect the location of the clients. By having such a capability it provides continuous flow of connection.

According to the current stage in the network the mesh nodes can be classified as Intragroup routers, Intergroup routers and free routers. In Intragroup routers communication occurs within the groups, In Intergroup routers communication takes place with different groups but in free routers no communication is involved in both intra and inter groups.

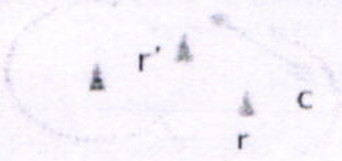

Figure.2.Client movement

Figure.3. Client Tracking

The operation of the mobile mesh nodes changes while tracking the clients as follows

- ***Intragroup Adaption*** –When the changes happen in the topology the Intragroup routers may adapt themselves according to the network.
- ***Reclamation of the redundant routers***- The node does not participate in any routing activities and deployed for the future use.
- ***Interconnecting Groups*** –When the splitting happens in the group, free router change their mode to participate in the interconnecting groups.

III.TOPOLOGY ADAPTATION

By reducing the no of nodes and the long path, two types of adaptations are required namely local adaptation and global adaptation. In local adaptations, the intergroup routers are saved by replacing the independent bridge networks with star network. Generally a star network provides the shorter relay parts and as results low number of router which participating in the intergroup activities.

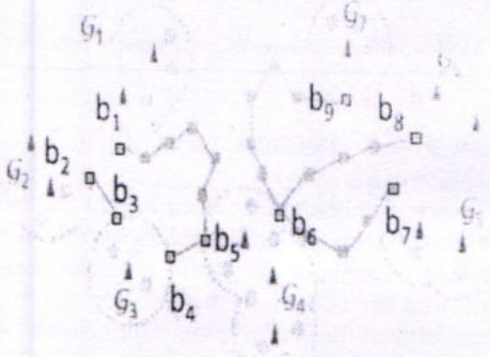

Figure.4.Without adaptation

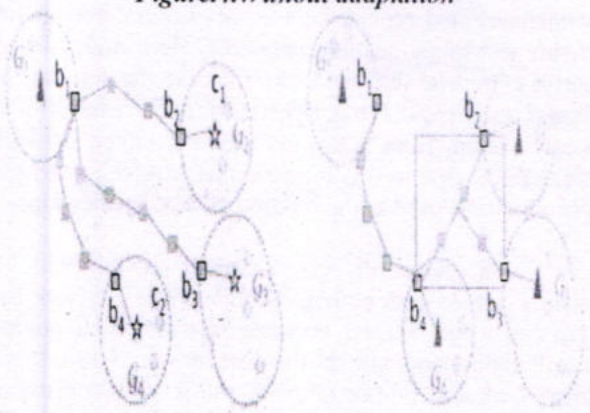

Figure.5.Local Topology Adaptation

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Agribot-"Future Farmer's Friend"

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Abstract— **This robotic vehicle is an agricultural machine of a considerable power and great soil clearing capacity. This multipurpose system gives an advance method to sow, plough, water and cut the crops with minimum man power and labour making it an efficient vehicle. The machine will cultivate the farm by considering particular rows and specific column at fixed distance depending on crop. Moreover the vehicle can be controlled through Bluetooth medium using an Android smart phone. The whole process calculation, processing, monitoring are designed with motors & sensor interfaced with microcontroller.**

Keywords: **Microcontroller, Sensors, Relay, Driver circuit.**

I. INTRODUCTION

In the field of agriculture, various operations for handling heavy material are performed. For example, in vegetable cropping, workers should handle heavy vegetables in the harvest season. Additionally, in organic farming, which is fast gaining popularity, workers should handle heavy compost bags in the fertilizing season. These operations are dull, repetitive, or require strength and skill for the workers.

In the 1980s, many agricultural robots were started for research and development. Kawamura and co-workers developed the fruit harvesting in orchard. Grand and co-workers developed the apple harvesting robot. They have been followed by many other works.

Over history, agriculture has evolved from a manual occupation to a highly industrialized business, utilizing wide variety of tools and machines. Researchers are now looking towards the realization of autonomous agricultural vehicles.

The first stage of development, automatic vehicle guidance, has been studied for many years, with a number of innovations explored as early as the 1920s. The concept of fully autonomous agricultural vehicles is far from new examples of early driverless tractor prototypes using leader cable guidance systems date back to the 1950s and 1960s.

In the 1980s, the potential for combining computers with image sensors provided opportunities for machine vision based guidance systems. During the mid-1980s, researchers at Michigan State University and Texas A&M University were exploring machine vision guidance. Also during that decade, a program for robotic harvesting of oranges was successfully performed at the University of Florida. In 1997, agricultural automation had become a major issue along with the advocacy of precision agriculture

A robot is a machine that can be programmed and reprogrammed to do certain tasks and usually consists of a manipulator such as a claw, hand, or tool attached to a mobile body or a stationary platform.

Autonomous robots work completely under the control of a computer program. They often use sensors to gather data about their surroundings in order to navigate.

Tele-controlled robots work under the control of humans and/or computer programs. Remote-controlled robots are controlled by humans with a controller such as a joystick or other hand-held device. The outline of the paper is as follows. In the next section, we describe about the previous methods / survey related to this methodology. In section 3, the proposed methodology is explained. Section 4 presents the In section 2, the proposed methodology introduced is explained. Section 3 includes Results of the proposed methodology. Section 4 gives some concluding remarks on this paper.

II. PROPOSED METHODOLOGY

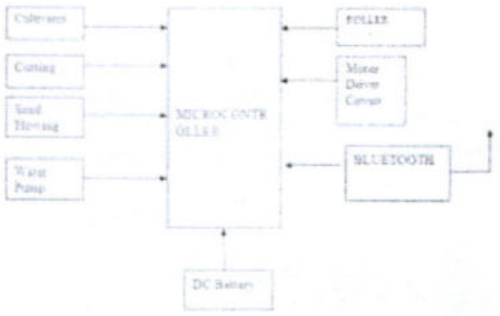

Fig: Vehicle Unit

Working principle

In this project we will be fabricating a multipurpose irrigation vehicle that will be able to DIG the Earth, Sow the seeds and Cultivate the crop after the harvest is ready, We will be using a android smart phone application to control the vehicle vehicle to respond to the control signal this type of vehicle should be useful for the farmers as a low investment option instead of buying 2 or more machines to do this work done by a single machine of ours.

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Heart of our robot is intel's most power family of microcontroller 8051,we are using at89c2051 Two microcontrollers ic2 is first microcontroller which acts as master controller ,decodes all the commands received from the transmitter and is responsible for executing all the commands received from the remote and also generating pwm pulses for the speed control . ld293 motor driver ic which drives two motors these two motors are vehicle driver motors and it also runs the motors for all other attachments of agriculture in the vehicle

2.1 Microcontroller

Fig: AT89S52 microcontroller

The AT89S52 is a low-power, high performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable flash memory. The device is manufactured using Atmel's high-density non-volatile memory technology and is compatible with industry standard 80C51 instruction set and pinout.

The AT89S52 provides the following standard features: 8K bytes of flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timers/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry.

III.RESULTS

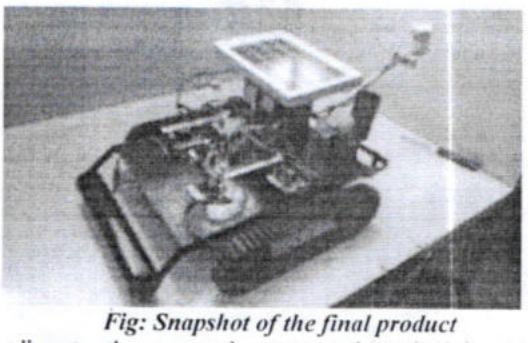

Fig: Snapshot of the final product

According to the terms the proposed methodology was successfully accomplished. The controlling of the vehicle unit was done through the App which is installed on the Android smart phone.

Through the phone the commands are given which the vehicle unit follows: some of the commands are moving the vehicle forward, Reverse, left and Right. Along with that the vehicle unit can also perform seed sowing, cultivating, harvesting, ploughing and rolling.

IV. CONCLUSION

This multipurpose system gives an advance method to sow, plough and cut the crops with minimum man power and labour making it an efficient vehicle. The machine will cultivate the farm by considering particular rows and specific column at fixed distance depending on crop. The obstacle detection problem will also be considered, sensed by infrared sensor.

This paper provides a brief review of the research on technologies in agricultural vehicles over the past 20 years. Although the research developments are abundant, there are some shortcomings (e.g., low robustness of versatility and dependability of technologies) that are delaying the improvements required for commercialization of the guidance systems. It can be concluded that either GPS and machine vision technologies will be fused. together or one of them will be fused. with another technology (e.g., laser radar) as the trend development for agricultural vehicle guidance systems. The application of new popular robotic technologies for agricultural guidance systems will augment the realization of agricultural vehicle automation in the future.

V. ACKNOWLEDGEMENTS

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1	Spectrum sharing scheme to minimize overlapping channels in AMMNET	Sowmya AM	Computer Science and Engineering	International Journal of Engineering research & technology(IJERT)	2015-16	ISSN:2278-0181	https://www.ijert.org/icesmart-2015-volume-3-issue-19
2	Positioning of mobile sink in the efficient and best position in the wireless sensor network	Arpitha Vasudevan	Computer Science and Engineering	International Journal of Engineering research & technology(IJERT)	2015-16	ISSN:2278-0181	https://www.ijert.org/research/positioning-of-mobile-sink-in-the-efficient-and-best-position-in-the-wireless-sensor-network-IJERTCONV3IS19016.pdf
3	Plant diseases detection using Image processing techniques	Saanjana	Computer Science and Engineering	IJIRSET	2015-16	ISSN:2347-6710	https://ijetae.com/files/ACCE15/IJETAE_ACCE_15_04.pdf
4	Opinion Mining	Lorate Shiny	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2015-16	ISSN:2250-1046	http://journal.bonfring.org/special_issue.php?id=8
5	Numerical Simulation of Ship Hull Interaction	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
6	Numerical Simulation of a Cyclone Separator	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
7	Invisibility System using image Processing and opticalcamouflage technology	Kalamani P	Computer Science and Engineering	International journal of Advanced research in science & engineering	2015-16	ISSN:2319-8354(E)	http://ijarse.com/currentissue.php?id=89
8	Increasing efficiency of mobile sink WSN using global best positionaing mechanism	Arpitha Vasudevan	Computer Science and Engineering	International Journal of Emerging technology and Advanced Engineering	2015-16	ISSN:2250-2459	https://ijetae.com/ACCE15.html
9	Hyperbolic Tangent Fluid Flow Through A Porous medium in an Inclined Channel with Peristalsis	Dr.P.Gangavathi	Mathematics	IJASRM	2015-16	ISSN 2455 6378	http://ijasrm.com/wp-content/uploads/2016/04/IJASRM_V1S4_035_113_121.pdf
10	Extraction of diabetic and eye diseases from the retinal images using image processing algorithms	B.Srilatha	ECE	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ugc.ac.in/journallist/subjectwisejurnallist.aspx?tid=SW50ZXJuYXRpb25hbCBKb3VybmFsIG9mIEFwcGxpZWQgRW5naW5lZXJpbmcgUmVzZWFyY2g=&&did=Q3VycmVudCBhbmQgQ2Vhc2VklFRpdGxlcw==
11	DESIGN AND ANALYSIS OF PRE COMPRESSING OF AIR IN A SINGLE CYLINDER FOUR STROKE ENGINE AT BDC	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
12	Computer vision and Machine vision techniques for assessing quality of food products-A review	Raghavendra Rao	Computer Science and Engineering	Bonfring IJSEand SC	2015-16	ISSN:2250-1045	http://journal.bonfring.org/special_issue.php?id=7

13	Biometric Verification using Face recognition	Sanjanaa	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2015-16	ISSN:2250-1047	http://journal.bonfring.org/special_issue.php?id=9
14	Architectural pattern to improve BusinessBusiness Application using model view Controller	G.Manjula	Computer Science and Engineering	Bonifering International journal of software engineering and soft computing	2015-16	ISSN:2250-1045	http://journal.bonfring.org/special_issue.php?id=7
15	Aerodynamic Design and Analysis of a Formula Vehicle Using CFD	Prof. Muthuvel A	Mechanical Engineering	International Journal of Applied Engineering Research	2015-16	ISSN 0973-4562	https://www.ripublication.com/Volume/ijaerv10n13spl.htm
16	A Survey on aware of local global cloud backup storage for personal purpose	Kalamani P	Computer Science and Engineering	International journal of Emerging technology and advanced engineering	2015-16	ISSN:2250-2459	https://ijetae.com/ACCE15.html
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Spectrum Sharing Scheme to Minimize Overlapping Channels in AMMNET

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***Abstract*— Autonomous Mobile Mesh Network (AMMNET) is a new class of Mobile Ad-hoc Network (MANET), which will not undergo network partitioning like MANET. AMMNET are used in crisis management and battlefield communication, where team members will work in group scattered in application terrain. Unlike conventional mesh networks, the mobile mesh nodes of an AMMNET are capable of following the mobile clients in the application terrain, and they form different network topology to ensure good connectivity for both intra-group and inter-group communications. But the interference is the problem occurred due to overlapping channels. This problem is addressed by introducing dynamic spectrum access protocol in which client-to-client users can communicate directly with each other using the same frequency resources as simultaneously active uplink between a mobile client and mesh nodes is established. This protocol is opportunistic as a link between two clients can only be utilized with their use of the spectrum stays within the interference temperature of the network. This also reduces overhead of intra-group routing in mesh nodes.**

Index Words*— Autonomous Mobile Mesh Network, Mobile Ad-hoc Network, mobile clients, mesh nodes, dynamic spectrum.

I. INTRODUCTION

Wireless communication technology is one of the most changing and enabling technologies. Mobile Ad Hoc NETwork (MANETs) is one of the popular wireless communication technologies. In this MANET there is no pre-constructed infrastructure for communication, such a network does not require any infrastructure for communication. Mobile nodes help to forward data packets from source to destination node using multiple-hop relay, and acts as routers. Hence MANET is suitable where no fixed infrastructure is available or infeasible. The ad hoc network can be reused for different applications by relocating network in different places at different time and so it is cost effective.

MANET is formed by number of nodes, which are dynamic in nature. The dynamic nature of nodes makes routing very difficult, and leads to breakup of routes frequently which affects network connectivity. This makes MANET to undergo network partitioning. This limitation makes MANET infeasible where team members need to work in groups such as battlefield communication and crisis management. An Autonomous Mobile Mesh Network (AMMNET) is a network which contains mobile clients and mesh node. The wireless mesh nodes contain multiple radios in single node which helps to handle multiple frequency bands. These mesh nodes also have mobility, unlike regular mesh network. Mobile mesh nodes in AMMNET move along with mobile clients in application terrine, and construct network topology and helps mobile clients to communicate. When mobile clients move in application terrine mobile client tracking algorithm is adopted to track the mobile client by mesh node with respect to mobility of clients.

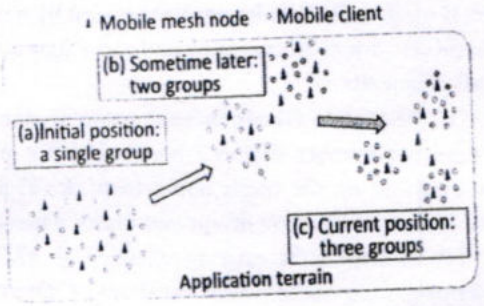


Fig 1. Representation of Autonomous Mobile Mesh Network (AMMNET)

AMMNET contains mobile clients and mobile mesh node in one group. When mobile clients start moving mesh clients also move along with mobile clients (fig1a). The node of AMMNET split into groups (fig1b) with time and forms two are more intra-groups. The mesh nodes adapt network topology to form connectivity between all mobile clients (fig1c) and make inter-groups communicate.

Mobile clients in AMMNET suffer from overlapping channel [1] in communication. Missing of client node is the main problem arises in this type of network. The location of each mobile mesh node is given with a GPS and then the mesh node can find the location of mobile client within its sensing range. RFID [5] is another way for finding the location of nodes. If mobile mesh nodes are given with RFID reader to detect the mobile client. Dynamic spectrum access protocol is a technique [2] which is used to assign different bandwidth to different nodes within the range of bandwidth available. This make frequency resources as simultaneously

active uplink between a mobile client and mesh nodes is established.

The mesh nodes in AMMNET will act as routes also hence in this paper mesh nodes are also referred as routers. Ad hoc On-Demand Distance Vector Protocol (AODV) routing protocol which is used in forwarding data in MANET is only used to transmit data in AMMNET. Any other protocols used in MANNET for data transmission can be used since the routers are not fixed in a single location.

II. EXISTING SYSTEMS

AMMNET is a new class of network where mobile clients are robust against network partitioning. The mobile mesh nodes provide the routing and relay of data to the mobile clients of AMMNET, by this mesh nodes the mobile clients can communicate. The mobile clients send data directly to the mesh nodes. These mesh nodes are used as routers and transmits data to the destination.

The mesh node not only acts as router but the main job of mesh node is to track the mobile client and find location. This makes the mesh node to drain its battery power. If mesh node fails its can be replaced by new one and the mesh network will recognize and reconfigure new mesh node automatically.

If the mobile clients in application terrine increases with time but number of mesh nodes will not increase, it forms overhead on the mesh nodes to track all the mobile clients. If the mobile client disappears then the mesh node has no ability to search the missing client. The AMMNET as number of mobile nodes, while transition of data they suffer from overlapping of channels.

A. *Disadvantages*

- Overlapping of channels.
- Number of mesh nodes will not increase with increase of mobile clients.
- Mesh nodes are not capable of missing mobile clients.

III. PROPOSED SYSTEM

AMMNET contains mobile clients and mesh nodes where mesh nodes are used for tracking of mobile clients and forwarding data for mobile clients of which are in the different groups. Since mobile nodes suffer from channel overlapping, Dynamic Spectrum Access protocol is proposed, were client to client data forwarding is done by sharing different bandwidth frequencies between all the client in available range of bandwidth dynamically.

Dynamic Spectrum Access protocol is used to minimize the overlapping of channels, mobile client are assigned with different bandwidth within the range of mesh node to which it is connected to. By this client-to-client users can communicate directly with each other using the same frequency resources as simultaneously active uplink between a mobile client and mesh nodes is established. This protocol is opportunistic as a link between two clients can only be utilized with their use of the spectrum stays within the interference temperature of the network. This also reduces overhead of intra-group routing in mesh nodes.

The mobile clients share different bandwidth and within intra-group forwarding of data between mobile clients are done without interaction of mesh node. Where as to communicate with the mobile client of inter-group client, mobile client request mesh node to route data to inter-group. This reduces the overhead at mesh node. The power consumption of the mesh node is reduced because of reduction of data forwarding in intra-group.

A. *Advantages*

- Achieves performance superior to existing protocols in terms of energy efficiency, packet delivery ratio (PDR) and latency.
- The mobile mesh nodes adapt their topology accordingly to archive full connectivity for all the mesh clients.
- A mobile client tracking solution to deal with the dynamic nature of client mobility.
- An AMMNET trics to prevent network partitioning to ensure connectivity for all its users. This property makes AMMNET a highly robust MANET.
- Eliminates overlapping channels.
- Reduce overhead of mesh node.
- Minimizes delay and increases through put.
- Minimizes power consumption in mesh nodes.

IV. OVERVIEW OF NETWORK

AMMNET is a network made up of mobile clients and mobile mesh node, where mobile clients are users and mobile mesh nodes are the one used to track the mobile clients. The mobile mesh nodes are called as mesh nodes and routers (intra-group routers, inter-group routers and free routers). Since both the type of node move in group, AMMNET is called as group mobility model.

The mobile mesh nodes according to its role can be classified as following.

A. *Intra-group router*

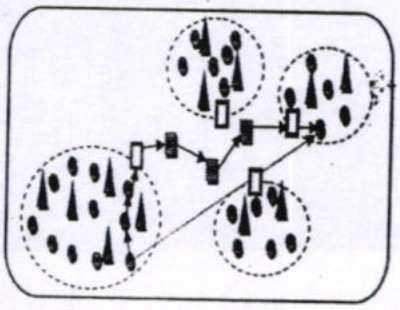
If a mesh node has at least one mobile client within the radio frequency range of mesh node, which helps to route the clients data from one router to another router within the group is called intra-group router. Mesh node in Fig. 2 act as intra-group router.

B. *Inter-group router*

If the mesh node is inside a group (Fig. 2) and helps to forward mobile clients data from its group to destination in other group then it is called as intra-group routers.

C. Free routers

The mesh nodes without any mobile client within its range (Fig. 2) and helps to route data from inter-group router to other inter-group router is called free router.



Mobile node Mesh node Mesh node as free router Intergroup router.

Fig 2. Overview of AMMNET

V. SYSTEM DESIGN

An AMMNET is a mesh-based infrastructure that forwards data for mobile clients. A client can connect to any nearby mesh node, which helps relay data to the destination mesh node via multihop forwarding. Like stationary wireless mesh networks, where routers are deployed in fixed locations, routers in an AMMNET can forward data for mobile clients along the routing paths built by any existing ad hoc routing protocols, for example, AODV. Unlike stationary wireless mesh networks, where routers are deployed at fixed locations, routers in an AMMNET are mobile platforms with autonomous movement capability. They are equipped with positioning devices such as GPS, to provide navigational aid while tracking mobile clients. Clients are not required to know their locations, and only need to periodically probe beacon messages. Once mesh nodes receive the beacon messages, they can detect the clients within its transmission range. With this capability, mesh nodes can continuously monitor the mobility pattern of the clients, and move with them to provide them seamless connectivity. Mesh nodes can exchange information, such as their locations and the list of detected clients, with their neighboring mesh nodes.

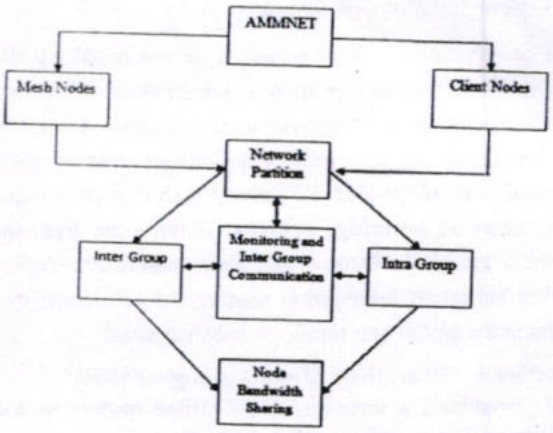


Fig. 3. System Architecture

The mobile clients stats moving and undergo network partition. The mesh node follows the mobile client and form groups of clients. The mesh nodes act as inter-router and intra-router to make all mobile clients to communicate with them. After formation of groups the bandwidth of mesh node is shared with the mobile clients dynamically, such that no mobile client in a same group is given with same bandwidth at a time.

A. Mobile Client Tracking

At first all the mobile clients send Becon message to the mesh node within its range. The mesh node check the client list to find the client from which it got message and if it is not present, request to neighboring mesh nodes for client list. If mobile client is present in inter-group then router and identify the node. If the mobile node is new then mesh node adds the node to its list and follow the new mobile client of that group.

Algorithm 1: Mobile tracking algorithm
Step1: Send Becon message interval to mesh node.
Step2: In intra-group request client list and all are covered by neighbors.
Step3: In inter-group, retrieve location of router and identify.
Step4: If free, navigate to inter-group and request router to follow the new intra-group member (mobile client)
Step5: Repeat and end

B. Topology Adoption Locally

A star topology of the local routers is created by converting intra-group router to inter-group routers, of which other group inter-group router is in its range. Then all neighbor inter-group routers are computed to star topology and bridge network is build to connect bridge network. The routers are triggered to adopt new topology and then free routers are reclaimed to add to the new topology

Algorithm 2: Connectivity of new topology locally
Step1: Compute single star topology model.
Step 2: Build bridge network connecting all neighbors.
Step 3: Trigger router to adopt new topology.
Step 4: Reclaim free router to topology.
Step 5: End

C. *Topology Adoption Globally*

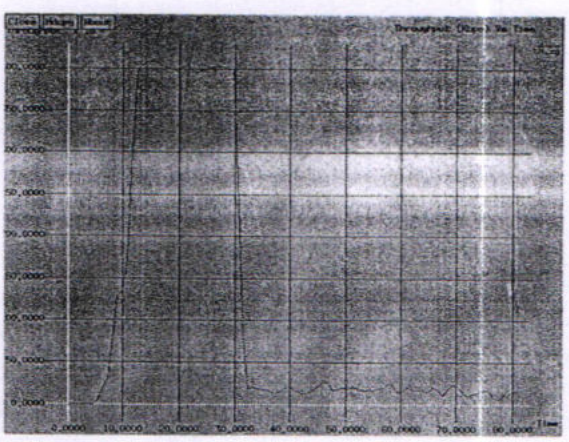
After construction of local topology, a star topology should be connected between free routers, which there are no mobile clients in its range and triggered as free routers. A message is broadcasted to all the routers to collect routers location information to adopt global topology such that all groups are inter connected by bridge network. If there are free routers present a subset is formed and free routers are deployed. Another subset of inter-group routers are connected to free routers and a global star topology is construeted.

Algorithm 3: Connectivity of new topology globally
Step1: Broadcast a message to all bridge routers to collect information and coordinate global adoption.
Step 2: If free router, deploy a subset of inter-group router.
Step 3: Free routers deploy a subnet of router.
Step 4: If router at inter-group are more, adopt free subnet of router to connect to inter-group routers.
Step 5: Send Becon messages to router and collect information and repeat.

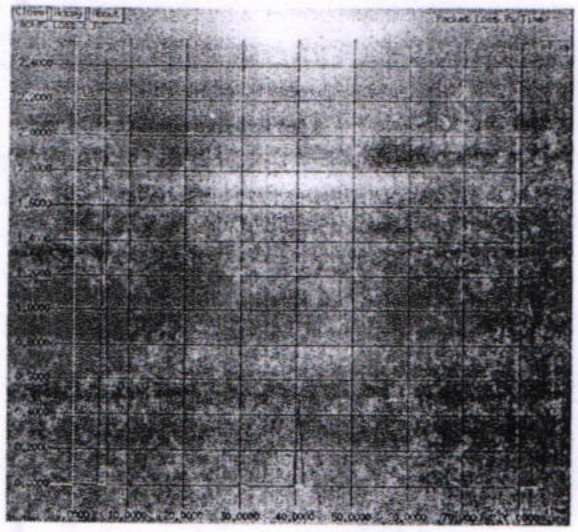
D. *Spectrum Sharing*

Dynamic Spectrum Access Protocol is used to share the bandwidth with the mobile clients. Using this protocol the mobile clients in same group share the bandwidth range of mesh node dynamically. This also helps client to client communication in intra-group. This protocol is opportunistic as a link between two clients can only be utilized with their use of the spectrum stays within the interference temperature of the network

VI. RESULT



To find throughput of the data forwarding of the mobile clients in the network a xgraph is plotted by taking throughput in Kbps versus time. When the mobile clients transmit data in a group without moving to another groups the through put is maximum, but if mobile clients changes group the throughput will reduce by small amount.



The loss of packets is found by plotting a graph of packet loss at y axis and time at x axis. At the time of topology adaption and reconstruction the mesh nodes are over headed an packet loss will be more. At the time of no over head there is a minimum or no packet loss is occurred.

VII. CONCLUSION

A set of mobile nodes will communicate in application terrine without undergoing network portioning with the help of mesh nodes by forming inter-groups and intra-groups. The adoption of network topology with introduction of new nodes is dynamically done in AMMNET. The overlapping of channels in mobile clients is minimized by dynamic spectrum sharing protocol. But problems like finding of missing client by mesh node still difficult to implement. Increasing mobile client will increase the overhead in mesh client.

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Positioning of Mobile Sink in the Efficient and Best Position in the Wireless Sensor Network

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***Abstract*— Due to the movement of the sink breakage of inter nodes routes takes place, therefore the routing recovery is a critical challenge. The Immune Orthogonal Learning Particle Swarm Optimisation Algorithm (IOLPSOA) can improve the method with faster global convergence and higher route recovery due to the movement of the sink. In this project I propose a new mechanism where there will be multiple sink in a WSN and sinks are deployed with priorities. Sinks in the sensing field work based to the priority. At a particular time only one sink will be in motion which has highest priority at that time and it will find the global best position (GBP) and moves towards it. The sink will get the information about the GBP by collecting information about the nodes in the network. With the help of that information from the sensor nodes the sink will calculate the GBP and path to move there. When the sink will depletes to 20% of its energy then it will send request to the next highest priority sink which will be static. As soon as second sink receives the request from the depleted sink, it will start moving towards the depleted sink and takes its position gradually. This new sink will collect the required data from the nearby nodes until and unless the depleted sink dies. Immune Orthogonal Learning Particle Swarm Optimisation Algorithm (IOLPSOA) is used to maintain route from source node to sink which provide fast routing recovery and construct the efficient alternative path to repair the route. In this method network efficiency and network lifetime will increase.**

Index Words*— Global Best Positioning, IOLPSOA, mobile sink, routing recovery, wireless sensor networks.

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have plays important role of the Internet of Things (IoT) are used in many benefits around the world, such as volcano and fire monitoring, urban sensing, to find out rare animal and perimeter surveillance. In the WSNs, a sink is defined as an entity that collects data from the sensors in the sensing field. With the development of 3G phones, mobile PDAs and other handheld devices, more and more applications need to integrate sink node. With the help of these devices, mobile sink is needed to fulfill the requirement. A mobile sink can potentially continue the network's lifetime by using lower energy of the sensor nodes close to sink due to its changing positions. Internet is extending its reach to the real world through innovations collectively termed the Internet of Things. The IoT connects a variety of access devices with the mobile network and Internet, and uses the analysed sensor data to provide users with many specific services, such as remote medical care and intelligent transportation system. Wireless sensor networks (WSNs) have played an important role of IoT due to the inability of collecting data from the environment and reporting them back to a sink. In the WSNs, a sink is defined as a user that collects the data reported from the network, such as PDAs and robots equipped with wireless devices. With the development of 3G phones, mobile PDAs and the handheld devices, more and more applications need to integrate sink node with these devices, thus mobility of sink is required. In these applications, most of the nodes stay static while sinks are mobile. It has been demonstrated that a mobile sink can potentially increase the network's lifetime by causing lower consuming energy of the sensor nodes close to the sink due to its changing positions.

Mobile sink can gradually continue the network's lifetime by using lower energy of the sensor nodes close to sink due to its changing positions. In Mobile sink whenever a path from the source node to mobile sink is broken due to the sink mobility, routing recovery messages would be exchanged to form an alternative path. In order to build an alternative path from the source node to the sink information provided by the previous path is used. This method increases the communication overhead and thus reduces the network performance in terms of delay and energy consumption.

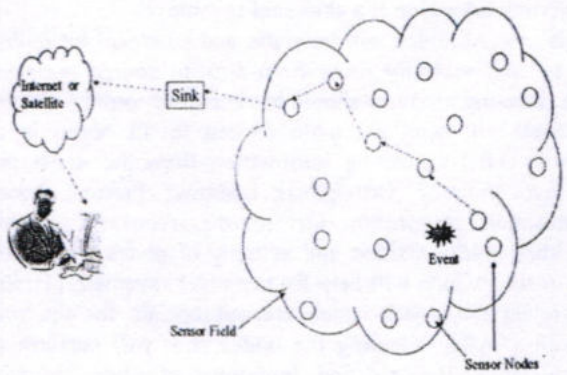


Fig. 1. Representation of wireless sensor network

A Particle Swarm Based routing recovery method is to address the problem of data delivery from the sources to the mobile sink. PSOA adjusts its flying path according to its personal best experience and global best experience. Offer a faster global convergence and higher solution quality and improves network performance .As we know, Particle Swarm

Optimization Algorithm (PSOA) searches for an optimum solution through each particle flying in the search space and flying trajectory is adjusted according to its personal best and global best experience [2]. Owing to its simple algorithm structure and high efficiency, PSOA has become a widely adopted optimization technique.

Particle Swarm Optimisation Algorithm (PSOA) was improved by using the cooperative behavior of multiple swarms and Cooperative Particle Swarm Optimisation Algorithm (CPSOA) was made. In CPSOA limitation of a particle is compensated by all other particles. Then Orthogonal Learning Particle Swarm Optimisation Algorithm (OLPSOA) was developed to guide the particle to fly towards the global optimum more steadily. OLPSOA got revised to IOLPSOA by adding the immune mechanism [7]. This will provide more diversity to the algorithm. I am using Immune Orthogonal Learning Particle Swarm Optimisation Algorithm for routing recovery. It provides efficient route repair for topology changed by the sink movement, communication overhead is reduced and WSNs lifetime is increased.

II. EXISTING SYSTEMS

IOLPSOA algorithm is used to address the routing problem of data transmission from sources to the mobile sink. IOLPSOA uses basics of Particle Swarm Optimization Algorithm. In PSOA search for an optimal solution through each particle flying in the search space and adjusting its flying trajectory according to its personal best experience and global best experience is done. Owing to its simple structure and high efficiency, the PSOA has become widely adopted optimization technique.

The particle may suffer the phenomenon that some dimensions of the solution vector may be improved by one exemplar or deteriorated by the other exemplar, and lead to undesired local optimum [2]. Hence, how to discover more useful information to construct a promising and efficient exemplar to guide the particle flying steadily towards the global optimal region is a challenging issue.

In this system nodes will be static and sink will be mobile. Due to sink mobility route from sink to source node will break. Routing recovery should be done. For routing recovery first sink will send get node request to all nodes in the network. After collecting information from the nodes sink will use Immune Orthogonal Learning Particle Swarm Optimisation Algorithm for routing recovery. In this algorithm firstly position and velocity of nodes are updated time to time which will help for the sink movement [1]. Sink will select the nodes which are appropriate for the route formation. After selecting the nodes sink will perform the immunization step to find immunity of nodes in route formation.

In immunization step of IOLPSOA each particle can be considered as an antibody, it produces offspring by cloning, increases diversity in the search process by mutation, eliminates the inappropriate particle by immune suppression and stores the appropriate solution through immune memory. Only immune nodes are considered for route formation and other nodes are terminated. In the IOLPSOA, flying direction of the particle (antibody) is optimised by the OL strategy and its diversity is increased mostly by immune mechanism.

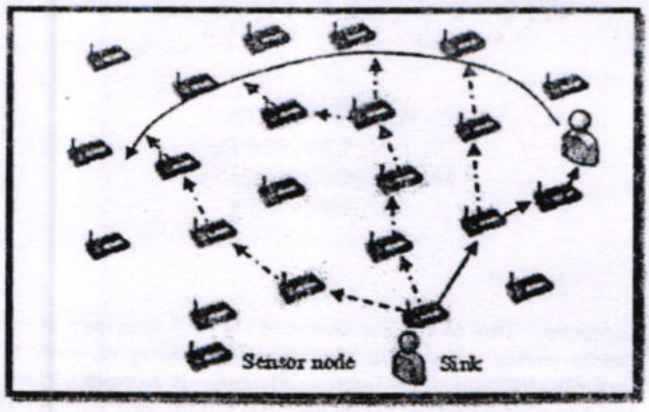


Fig 2 Routing recovery for mWSNs with a mobile sink

A. Advantages

- Routing recovery from path failure is fast.
- Offers faster global convergence and higher solution quality.
- Routing protocol in mobile sink is improved by using IOLPSOA.

B. Disadvantages

- Here the frequent information updates and communication overheads would consume excessive battery energy of the nodes, and shorten the network lifetime.
- The AODV and other conventional protocols always provide global network path recovery with high communication overheads.
- The existing mechanism reduces the network performance in terms of delay.

III. PROPOSED SYSTEM

In proposed system based on the number of the nodes multiple sinks are deployed. Priorities will be assigned to all the sinks and based on the priority sink will work. First priority sink will moving and other sinks will be static in particular position. Sink 1 which is mobile will send the get node packet which contains the sink id to the nodes in 1 hop distance to collect information of those nodes. After getting the get node request nodes will send information like position, energy level, data type and task table of that node to the sink. Nodes which has got get node request will pass the request to its neighbor nodes. And collect neighbor node information and pass it to the sink.

Once collecting information from all the required nodes sink will calculate the global best position (GBP). Global best position is the position where the transmission rate is higher and energy consumption is less. For the calculation of the global best position sink will collect information from the nodes that is blank places in the network. After getting this information sink will calculate particular blank position where maximum transmission rate, low energy consumption and having shortest path from maximum nodes.

Sink will calculate the path to move towards global best position. Sink will then establish the route with the nodes for data transmission. For this routing immune orthogonal learning particle swarm optimisation algorithm is used. In this algorithm node updating, immunization and termination steps are there. In updating step nodes for route formation are chosen. Immunization step will check immunity of nodes like remaining energy and immune nodes are selected. Other nodes are terminated which are not immune. IOLPSOA based routing recovery protocol provide fast routing recovery from path failure, which can support the sink mobility of conventional routing protocols.

Once first priority sink's energy depletes and only around 20% of energy is remaining it will send a request and its position to the second priority sink which is static replace it. Once sink 2 receives this request its start moving towards sink 1 position. Sink 2 will go near to the sink 1 and waits till sink 1 energy completely depleted. Once energy depleted sink 2 will replace sink 1 and sink 2 will collect all the information from the sink1.

Global best position will be changing based on the time and remaining energy in the nodes. So sink will be collecting the information from the nodes in particular time and by keeping track of this information GBP will be updated. By this method energy consumption can be reduced and network lifetime is increased.

A. Advantages

- The Computation Complexity over only one sink is reduced.
- Introduction of multiple sinks results in fast transmission.
- When the energy of one sink depletes it is being replaced by the new sink which helps in continuous transmission of data without any loss.

IV. SYSTEM DESIGN

First process is deployment of nodes which are static. Based on the number of nodes multiple mobile sinks are deployed. Priority will be assigned to the sinks. Sink will collect all the required information from the nodes and will be used for route recovery. Communication between sink and node will be done and all nodes information will be collected by sink for GBP calculation. Communication between sink and node is done by sending GN packet and receiving GNR packet [4].

Global Best Position is calculated. GBP position is the position where transmission rate will be high and energy consumption is less. While determining GBP also sink will be collecting information from the nodes and for this routing is required. For routing purpose IOLPSO algorithm is used which provides the efficient routing recovery. As there will be a sink movement breakage of route will be there and IOLPSO algorithm is used for routing recovery. Then sink will track the route to the GBP and it goes to that particular position. Once sink is in GBP routing is done again to the source node and data is collected. Sink will be moving in the defined path, when sink's energy depletes it sends request to the second sink to replace it and second sink will collect required information from first sink and replaces it. Like this the network energy will be saved.

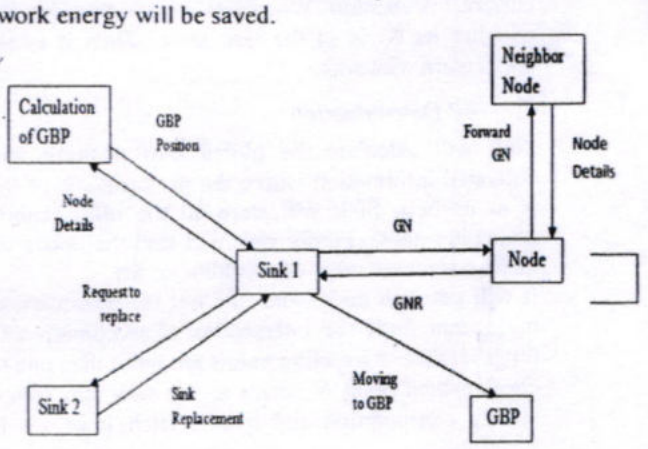


Fig. 3 Architecture Diagram

A. Network Deployment

First in the node deployment process, the requested node has to send a request to the main node with the help of the socket programming. The Server Socket Part of the main node shall receive the request which is sent from the requested node then it updates the IP and port that has been assign to that requested user. The new port which is for the respected node is sent back to the node and the node runs a server socket with the new port and thus the node gets deployed.

In the Sink mechanism the sink sends its own ip address and port number and then that information is sent to the main node. A listening thread for the sink is running on the background in order to receive the request sent from the sink. So the listening thread receives the ip and port sent from the sink and then it increases the port and after that the updated port number is sent back to the sink. The sink after receiving

the port number starts a new thread that listens on the new port number sent from the Main node.

B. Node Sink Communication

Sink will collect information from the nodes by sending GN to the nodes in 1 hop distance. Those nodes will forward GN to its neighbouring nodes and collects information from them like task table, id, and energy information. Node will send GNR back to the sink containing information about itself and its neighboring nodes [1]. Based on this information sink will calculate GBP and path towards GBP.

Algorithm 1: Collecting node information

Step 1: When the moving sink is disconnected it sends the GN packet containing the task table. The node received the GN increases from m to m+1 and relays the packet to its neighbours.
Step 2: If a node received GN is a node on the previous path, it responds the GNR containing its neighbour table and task table.
Step 3: The sink collects all the information of the nodes which have transmitted GNR, and updates its neighbour table. Then, the sink calculates and constructs the optimal alternative path.
Step 4: The sink broadcasts the packet GNR_ACK containing current information. Whenever a node receives it, it checks whether its ID is in the task table. Then it establishes the connection with sink.

C. GBP Determination

Sink will calculate the global best position with all the collected information where the performance of the network is at its best. Sink will store all the information from the nodes in a table. Firstly sink will find the nodes which have the maximum number of neighbor nodes.
It will get such nodes and find out the transmission of those nodes and finds the intersection of maximum transmission range. If that intersecting points are more than one then it will check which point is nearer to the sink and which has low energy consumption and it will fetch it as a Global Best Position.

Algorithm 2: Calculation of GBP

Step 1: Sink stores information from all the nodes and stores it in the table.
Step 2: Sink selects the node which have the maximum number of neighbor nodes.
Step 3: Then sink will calculate the intersecting point of transmission range.
Step 4: If more than one intersecting points are there then sink will check the point which is nearest and less energy consuming
Step 5: By taking all these criteria the GBP is calculated and sink will get the global best position.

D. IOLPSO Algorithm

This algorithm is used for the routing recovery. Because of the movement of the sink route will break and routing recovery is most important thing. With the help of IOLPSOA routing is done fast and efficiently [6].

Algorithm 3: Routing Recovery

Step 1: In this step node updating is done. Sink will see which are possible nodes can be involved in the routing.
Step 2: Nodes which are selected for routing are checked for their immunization [5].
Step 3: Which nodes are immune enough are selected and other nodes are terminated.
Step 4: By selected nodes route is formed.

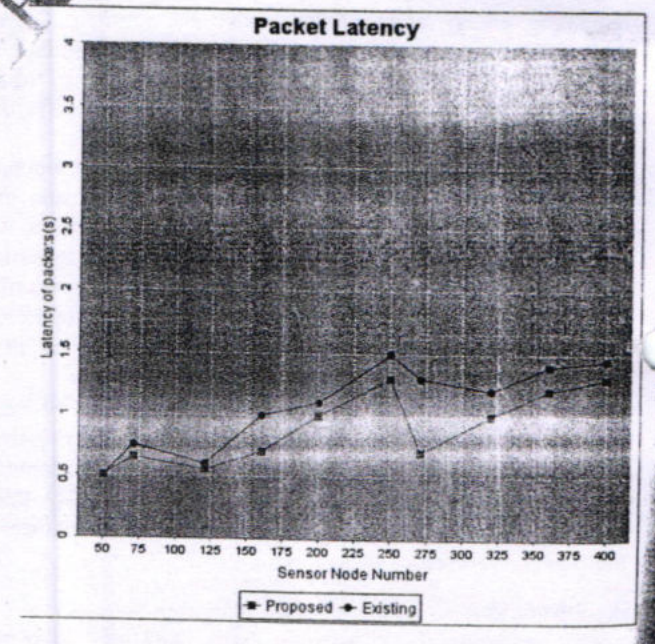
E. Tracking To GBP

In this step sink after getting the GBP will track the path towards that position. And move in such a way that it reaches the GBP efficiently.

F. Sink Replacement

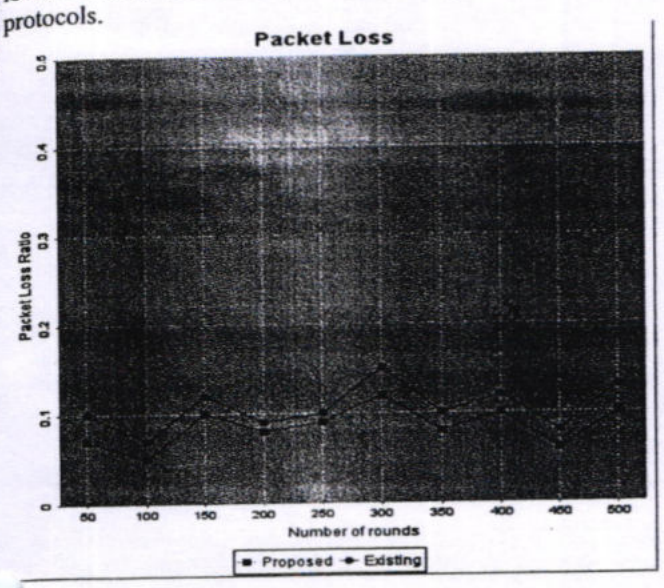
The sink will be moving in the defined path, when sink's energy depletes it sends request to the second sink to replace it and second sink will collect required information from first sink and replaces it. Like this the network energy will be saved.

V. RESULTS



The latency of packet delivery from source to the sink is given in above graph. X-axis represents the number of sensor nodes in the network and y-axis is the average data packet delivery latency. Because of the addition of time complexity of the proposed mechanism, the average latency of packet delivery of the IOLPSOA is less as compared. But as the network scale grows, new mechanism has demonstrated a

lower latency trend of packets delivery than the other protocols.



The proposed mechanism provides a fast routing recovery from path failure. Whenever the path is broken due to the sink movement recovery should be done as fast as possible. Delay in the routing recovery means more packet loss. New mechanism provides a fast routing recovery and packet loss is reduced efficiently.

VI. CONCLUSIONS

In this paper by calculating the GBP and moving sink to the GBP energy consumption of the network is reduced and lifetime is increased. GBP of the sink will be changing and in particular interval it is calculated again. IOLPSO algorithm also gives an energy efficient routing recovery. Sink movement improves the efficiency by replacing the depleted sink and thus network lifetime is increased. So by this all overall network lifetime and network efficiency is increased.

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Plant Disease Detection Using Image Processing Techniques

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ABSTRACT: The uploaded pictures captured by the mobile phones are processed in the remote server and presented to an expert group for their opinion. Computer vision techniques are used for detection of affected spots from the image and their classification. A simple color difference based approach is followed for segmentation of the disease affected lesions. The system allows the expert to evaluate the analysis results and provide feedbacks to the famers through a notification to their mobile phones.

The goal of this research is to develop an image recognition system that can recognize crop diseases. Image processing starts with the digitized color image of disease leaf. A method of mathematics morphology is used to segment these images. Then texture, shape and color features of color image of disease spot on leaf were extracted, and a classification method of membership function was used to discriminate between the three types of diseases.

KEYWORDS: Digital Photographs, Matlab, Image Processing.

I. INTRODUCTION

The classification and recognition of crop diseases are of the major technical and economical importance in the agricultural Industry. To automate these activities, like texture, color and shape, disease recognition system is feasible. Images were acquired under laboratory condition using digital camera. Three major diseases commonly found are Rice blast (Magnaporthe grisea), Rice sheath blight (Rhizoctonia solani) and Brown spot (Cochiobolus miyabeanus) were selected for this research. The management of plants requires close monitoring especially for the management of disease that can affect production significantly and subsequently the postharvest life. The naked eye observation of experts is the main approach adopted in practice for detection of plant diseases. However this requires continuous monitoring of experts which might be prohibitively expensive in large farms. Automatic detection of plant diseases is an essential research topic as it may prove benefits in monitoring large fields of crops and thus automatically detect the symptoms of diseases as soon as they appear on plant leaves. Therefore looking for fast, automatic, less expensive and accurate method to detect disease by calculating leaf area through pixel number statistics.

The leaf area monitoring is an important tool in studying physiological features related to the plant growth, photosynthetic & transpiration process. Also being helpful parameter in evaluating, damage caused by leaf diseases and pastes, to find out water and environmental stress, need of fertilization, for effective management and treatment.

This paper also presents an automated system integrated with machine vision techniques that will assist the farmers get the accurate information about their crops using their mobile phone. The uploaded pictures of paddy captured by the mobile phones will be processed in the central server and the analysis report will be presented to an expert group for their opinion, who will then be able to send proper recommendations through a simple notification using the system, according to the severity of the situation.

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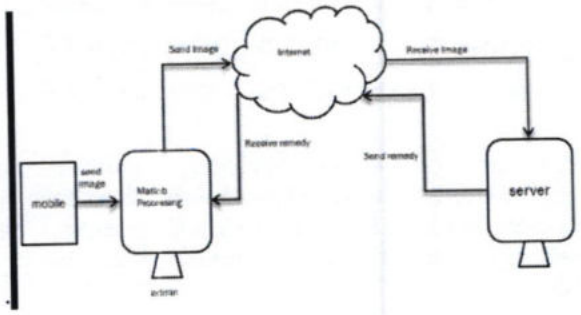
System Overview

The system consists of a mobile application, which will enable the farmers to take images of plants using their mobile phones and send it to a central server where the central system in the server will analyze the pictures based on visual symptoms using image processing algorithms in order to measure the disease type. An expert group will be available to check the status of the image analysis data and provide suggestions based on the report and their knowledge, which will be sent to the farmer as a notification in the application



Mobile Application Development

The mobile application consists of 5 basic functionalities. They are

1) Image capture,
2) Image selection,
3) Image zoom and crop,
4) Share image with expert group,
5) Receive notification from central server.

Image capture: At the very first page of the application, the application bar shows the icon for capturing image using the application. On navigation of the menu, the user gets to take image on shutter click event using the phone.

Photo capture using mobile application

Image selection: In case of previously taken pictures of paddy, the application navigation menu also contains the option of selecting an image from the existing photo library of the phone.

Image zoom and crop: The leaf of paddy is a very thin one, and it is important that the targeted area of the leaf gets focus in the image. The mobile application lets the farmer to zoom the affected region of paddy using pinch with two fingers. The test images were taken with a phone which has a camera in it. The application allows to zoom 4x times the

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original image. In addition, once the targeted region has been selected, the crop button of the crops the image in a 170x400 pixel frame, which in the targeted resolution for processing images in the server image processing application.

Selecting target region of paddy leaf in mobile application

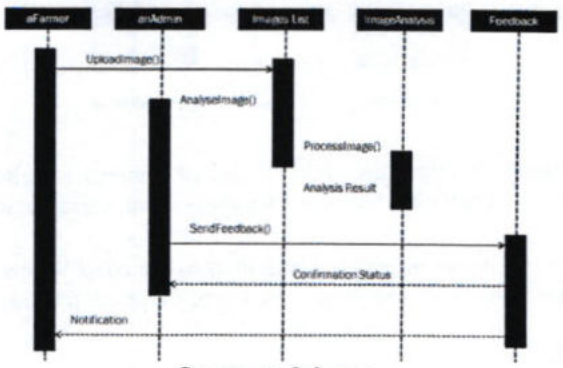
Share image with expert group:

This functionality of the application enables the farmer to send the captured/ selected image to be uploaded in the remote server using HTTP Web Services in Windows phone. The client mobile application uploads two basic types of data in the server for every request, the image that the farmer selects for seeking suggestion and a unique URL created through windows live services which is created for communicating with the mobile phone from a

remote application. The URL created using Windows Live service is used for sending notification from the server application of sent by the expert groups with their feedback.

Receive notification from central server:

Once the image has been uploaded in the remote server, the expert sends feedback to the client mobile application via notification. This notification is sent through a URL generated by Windows Live Services which is unique for every device. Once the notification is received, it is displayed in the application which the user will be able to view for taking appropriate steps suggested by the experts.



Sequence daigram

Server Script for Storing Data:

The image and the data uploaded from Windows Phone application is received in the server using a script. The images are stored within the assigned directory and the device URL is mapped in the database against every uploaded image in the database.

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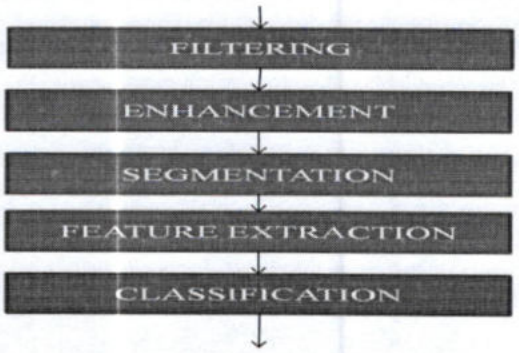
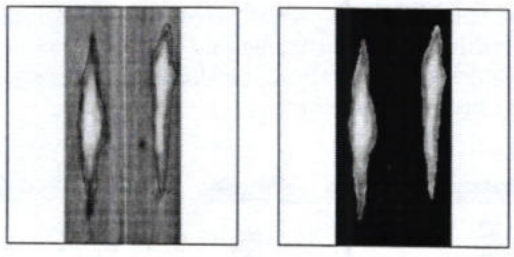
Local Server Application Development:

Every image in the server application is analyzed using machine vision techniques for identification of possible disease of plants presented in the image. Below figure shows the steps of image processing for both training and analysis stages of the process cycle. An image goes through the following steps for analysis.

Steps in Image Processing



Filtering: Filtering in image processing allows for selective highlighting of specific information. A number of techniques are available such as median filter, Gaussian filter, SRAD (speckle Reducing Anisotropic Diffusion) etc
Enhancement: Enhancement refers to accentuation, or sharpening of image features such as boundaries or contrast. Histogram Equalization, AHE(Adaptive Histogram Equalization), CLAHE(Contrast Limited Histogram Equalization).
Segmentation: Segmentation is the process of partitioning a digital image into multiple segments. Multilevel thresholding, Edge detection, active contours. Typically used to locate objects and boundaries in the image.



Original Image Segmented Image

Feature Extraction: Transforming the input data into the set of features is called feature extraction. Geometric features-area, perimeter, circularity, eccentricity. Statistical features- mean, variance, entropy, correlation.

Classification: We used the idea of maximum feature similarities as the basis for classification of the input image. In this stage, we measure the feature values of the input image and compare the Euclidean distance with features of already the learned images.

$DDff = FFiiiiiiiii - FFlllllllllll$

Here,

$DDff$ = Euclidean distance between feature of a input image and already learned image,

$FFiiiiiiiii$ = feature value for the input image .

$FFlllllllllll$ = feature value for the learned image

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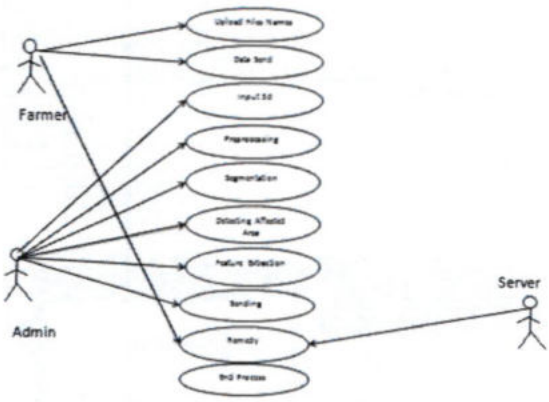
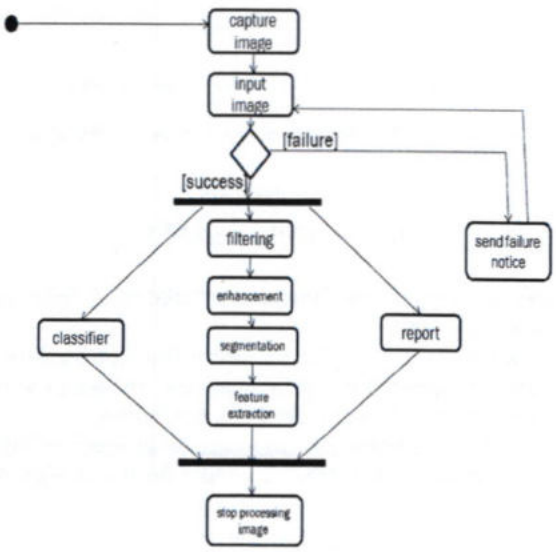
Presentation of classification results

Use case daigram





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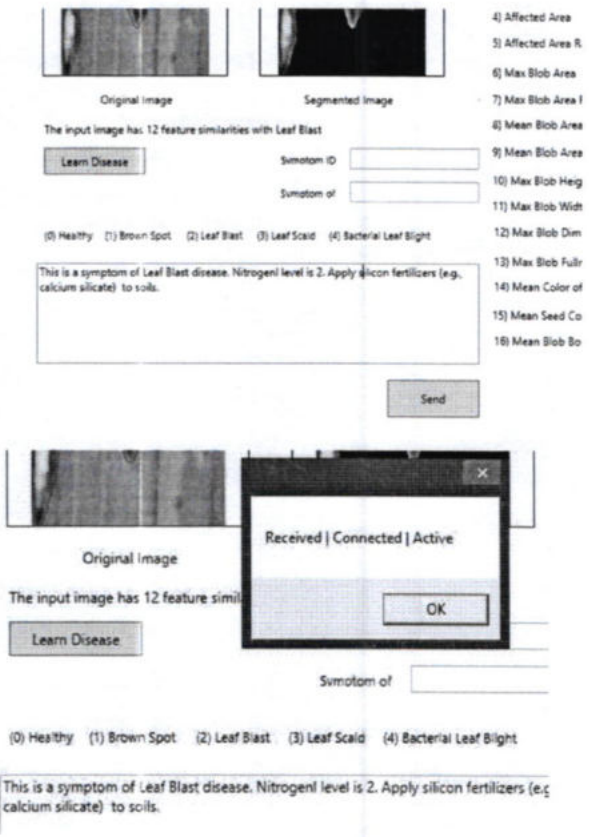
Activity diagram

Every image in the database stores a device URL against it which is used for sending notification to the corresponding the farmer who posted the image for suggestions. A form is displayed in the software window where the expert can write his observations and suggestions and send to the farmer.
Once the farmer receives the notification, the receipt confirmation is displayed at the expert software panel.

Sending feedback from the local server application

View in expert panel



II. CONCLUSION

After reviewing above mentioned techniques and methods we can conclude that there are number of ways by which we can detect disease and nutrient deficiency of plants
Each has some pros as well as limitations .On one hand visual analysis is least expensive and simple method, it is not as efficient and reliable as others are Image processing is a technique most spoken of very high accuracy and least time are major advantages offered, but it backs away when implementing practically.
Alongside the supply of cultivation tools, the farmers also need access to accurate information that they can use for efficient crop management and there is no better way than providing them a service that they can use through their mobile phones.

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Opinion Mining

S. Hemalatha, N. Gowri Chandra and M. Lorate Shiny

I. Introduction

SENTIMENT analysis (also known as opinion mining) refers to the use of natural language processing, text analysis and computational linguistics to identify and extract subjective information in source materials. Sentiment analysis is widely applied to reviews and social media for a variety of applications, ranging frommarketing to customer service.

Generally speaking, sentiment analysis aims to determine the attitude of a speaker or a writer with respect to some topic or the overall contextual polarity of a document. The attitude may be his or her judgment or evaluation (see appraisal theory), affective state (that is to say, the emotional state of the author when writing), or the intended emotional communication (that is to say, the emotional effect the author wishes to have on the reader).

II. Types of Sentiment Analysis

A basic task in sentiment analysis is classifying the *polarity* of a given text at the document, sentence, or feature/aspect level — whether the expressed opinion in a document, a sentence or an entity feature/aspect is positive, negative, or neutral. Advanced, "beyond polarity" sentiment classification looks, for instance, at emotional states such as "angry," "sad," and "happy."

Early work in that area includes TurneyandPangwho applied different methods for detecting the polarity of product reviews and movie reviews respectively. This work is at the document level. One can also classify a document's polarity on a multi-way scale, which was attempted by Pang and Snyder[4] among others: Bo and Lilian[3] expanded the basic task of classifying a movie review as either positive or negative to predicting star ratings on either a 3 or a 4 star scale, while Snyder[4] performed an in-depth analysis of restaurant reviews, predicting ratings for various aspects of the given restaurant, such as the food and atmosphere (on a five-star scale). Even though in most statistical classification methods, the neutral class is ignored under the assumption that neutral texts lie near the boundary of the binary classifier, several researchers suggest that, as in every polarity problem, three categories must be identified. Moreover it can be proven that specific classifiers such as the Max Entropy and the SVMs can benefit from the introduction of neutral class and improve the overall accuracy of the classification.

A different method for determining sentiment is the use of a scaling system whereby words commonly associated with having a negative, neutral or positive sentiment with them are given an associated number on a -10 to +10 scale (most negative up to most positive) and when a piece of unstructured text is analyzed using natural language processing, the subsequent concepts are analyzed for an understanding of these words and how they relate to the concept. Each concept is then given a score based on the way sentiment words relate to the concept, and their associated score. This allows movement to a more sophisticated understanding of sentiment based on an 11 point scale. Alternatively, texts can be given a positive and negative sentiment strength score if the goal is to determine the sentiment in a text rather than the overall polarity and strength of the text.

Subjectivity/objectivity identification

This task is commonly defined as classifying a given text (usually a sentence) into one of two classes: objective or subjective. This problem can sometimes be more difficult than polarity classification. The subjectivity of words and phrases may depend on their context and an objective document may contain subjective sentences (e.g., a news article quoting people's opinions). Moreover, as mentioned by Su,results are largely dependent on the definition of subjectivity used when annotating texts. However, Pang showed that removing objective sentences from a document before classifying its polarity helped improve performance.

Feature/aspect-based sentiment analysis

It refers to determining the opinions or sentiments expressed on different features or aspects of entities, e.g., of a cell phone, a digital camera, or a bank.A feature or aspect is an attribute or component of an entity, e.g., the screen of a cell phone, the service for a restaurant, or the picture quality of a camera. The advantage of feature-based sentiment analysis is the possibility to capture nuances about objects of interest. Different features can generate different sentiment responses, for example a hotel can have a convenient location, but mediocre food. This problem involves several sub-problems, e.g., identifying relevant entities, extracting their features/aspects, and determining whether an opinion expressed on each feature/aspect is positive, negative or neutral. The automatic identification of features can be performed with syntactic methods or with topic modeling.More detailed discussions about this level of sentiment analysis can be found in Liu's work.[17]

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III. METHODS AND FEATURES

Existing approaches to sentiment analysis can be grouped into four main categories: keyword spotting, lexical affinity, statistical methods, and concept-level techniques, Keyword spotting classifies text by affect categories based on the presence of unambiguous affect words such as happy, sad, afraid, and bored.[1] Lexical affinity not only detects obvious affect words, it also assigns arbitrary words a probable "affinity" to particular emotions.Statistical methods leverage on elements from machine learning such as latent semantic analysis, support vector machines, "bag of words" and *Semantic Orientation — Pointwise Mutual Information* (See Peter Turney's[1] work in this area). More sophisticated methods try to detect the holder of a sentiment (i.e. the person who maintains that affective state) and the target (i.e. the entity about which the affect is felt). To mine the opinion in context and get the feature which has been opinionated, the grammatical relationships of words are used. Grammatical dependency relations are obtained by deep parsing of the text.Unlike purely syntactical techniques, concept-level approaches leverage on elements from knowledge representation such as ontologiesand semantic networks and, hence, are also able to detect semantics that are expressed in a subtle manner, e.g., through the analysis of concepts that do not explicitly convey relevant information, but which are implicitly linked to other concepts that do so.[23]

Open source software tools deploy machine learning, statistics, and natural language processing techniques to automate sentiment analysis on large collections of texts, including web pages, online news, internet discussion groups, online reviews, web blogs, and social media. Knowledge-based systems, instead, make use of publicly available resources, e.g., WordNet-Affect, SentiWordNet,[1] and SenticNet, to extract the semantic and affective information associated with natural language concepts. Sentiment Analysis can also be performed on visual content i.e. images and videos. One of the first approach in this direction is SentiBank[28] utilizing an adjective noun pair representation of visual content.

A human analysis component is required in sentiment analysis, as automated systems are not able to analyze historical tendencies of the individual commenter, or the platform and are often classified incorrectly in their expressed sentiment. Automation impacts approximately 23% of comments that are correctly classified by humans.

Sometimes, the structure of sentiments and topics is fairly complex. Also, the problem of sentiment analysis is non-monotonic in respect to sentence extension and stop-word substitution (compare *THEY would not let my dog stay in this hotel* vs *I would not let my dog stay in this hotel*). To address this issue a number of rule-based and reasoning-based approaches have been applied to sentiment analysis, including Defeasible Logic Programming.[1] Also, there is a number of tree traversal rules applied to syntactic parse tree to extract the topicality of sentiment in open domain setting.

IV. EVALUATION

The accuracy of a sentiment analysis system is, in principle, how well it agrees with human judgments. This is usually measured by precision and recall. However, according to research human raters typically agree 79% of the time (seeInter-rater reliability).

Thus, a 70% accurate program is doing nearly as well as humans, even though such accuracy may not sound impressive. If a program were "right" 100% of the time, humans would still disagree with it about 20% of the time, since they disagree that much about *any* answer More sophisticated measures can be applied, but evaluation of sentiment analysis systems remains a complex matter. For sentiment analysis tasks returning a scale rather than a binary judgement, correlation is a better measure than precision because it takes into account how close the predicted value is to the target value.

V. SENTIMENT ANALYSIS AND WEB 2.0

The rise of social media such as blogs and social networks has fueled interest in sentiment analysis. With the proliferation of reviews, ratings, recommendations and other forms of online expression, online opinion has turned into a kind of virtual currency for businesses looking to market their products, identify new opportunities and manage their reputations. As businesses look to automate the process of filtering out the noise, understanding the conversations, identifying the relevant content and actioning it appropriately, many are now looking to the field of sentiment analysis.[1] Further complicating the matter, is the rise of anonymous social media platforms such as 4chan and Reddit. If web 2.0 was all about democratizing publishing, then the next stage of the web may well be based on democratizing data mining of all the content that is getting published.One step towards this aim is accomplished in research. Several research teams in universities around the world currently focus on understanding the dynamics of sentiment in e-communities through sentiment analysis. The CyberEmotions project, for instance, recently identified the role of negative emotions in driving social networks discussions.

The problem is that most sentiment analysis algorithms use simple terms to express sentiment about a product or service. However, cultural factors, linguistic nuances and differing contexts make it extremely difficult to turn a string of written text into a simple pro or con

sentiment. The fact that humans often disagree on the sentiment of text illustrates how big a task it is for computers to get this right. The shorter the string of text, the harder it becomes.

Even though short text strings might be a problem, sentiment analysis within microblogging has shown that Twitter can be seen as a valid online indicator of political sentiment. Tweets' political sentiment demonstrates close correspondence to parties' and politicians' political positions, indicating that the content of Twitter messages plausibly reflects the offline political landscape.

VI. Resources for Sentiment Analysis

Sentiment vocabularies and annotated word lists:

- Affective Norms for English Words (ANEW)
- SenticNet
- SentiWordNet
- WordNet-Affect
- Online sentiment analyzers:
- *AlchemyAPI*(commercial)
- Semantria(commercial)
- Sentiment140 (commercial, for Twitter)
- Stanford NLP] (academic)
- Werfamous(free)

Annotated corpora (documents with manual annotations of sentiment that can be used to evaluate algorithms):

- Twitter dataset in 4 languages (12,500 tweets)

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Numerical Simulation of Ship Hull Interaction

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Abstract—**This paper reports the comparison between computational simulations and experimental measurements of a ship hull and propeller interaction in steady state condition. The primary purpose of these efforts is to support the development of physics based high fidelity manoeuvring simulation tools by providing accurate and reliable hydrodynamic data with relevance to manoeuvring performances. The geometrical modelling of bare hull of KRISO container ship model is doneby using SOLID WORKS. The flow over the bare hull and propeller interaction is analysed with commercial CFD package STARCCM+. The analysis is carried out in unstructured trimmer mesh. Reynolds Averaged Navier Strokes (RANS) based Solveris used to perform simulations for validation purpose and for better understanding of fundamental flow physics under manoeuvring conditions. Grid independence test is also carried out for the better and accurate results. The numerical analysis dataand experiment results are compared with different turbulence models like standard k-ωWilcox, k- ω SST Mentermodel, AKN model and V2F model. The results indicate that pressure is uniformly distributed in the base of ship hull and there is dramatic variation of pressure in front stern region and the contours shows the stagnation point of ship, and the high velocity zones.It is observed that large wakes are formed in flow past rear end of ship.**

Keywords: KRISO; CFD; hull; propeller; hydrodynamic co-efficient.

I. INTRODUCTION

A propeller is a component which converts engine torque into propulsive force or thrust, thus overpowering a ship's resistance to forward motion by creating a sternward accelerated column of water. There is an increasing interest in the marine industry to improve the hydrodynamic and structural performance of naval structures. One of the most critical requirements for any marine design tool is the ability to simulate turbulent flow around ship hulls. Definition of the stream flowing near the hull of a vessel, at early stages of its planning allows solving qualitatively tasks of optimization of the hull form and configuration of the appendages; studying of operating conditions of thrusters, navigation devices and bow thrusters; definition of trim of high-speed crafts; studying the resistance coefficient. However, it is clear, that all aforementioned advantages of the computational fluid dynamics methods can be fully implemented only under condition of a good coordination of received results with the most reliable experimental and theoretical data. The study of hull propeller interaction is still in the nascent stage and adequate numerical investigations are not reported. This problem is a very challenging one because one need to consider a sliding mesh where a few blocks are moving and few blocks are stationary in the inertial frame of reference. Also, the flow over the propeller blade is inherently unsteady due to rotation of the blade through spatially varying wakes of the hull. To achieve accuracy in prediction, particular attention has to be paid to transition turbulence modelling, grid refinement and vortex preservation.

Jagadeesh and Murali [1] authors carried out both experimental and numerical investigation of hydrodynamic forces co-efficient of 3-D hull. The numerical investigation is carried out with AKN k-ε model incorporated in ANSYS Fluent software. Based on the study, the authors concluded that AKN k-ε modelwaswell suited to predict the hydrodynamic forces acting on hull.

Barros *et al.* [2] carried out a comparative study on CFD analysis, analytical and semi-empirical (ASE) method on MAYA HULL. For the CFD analysis, the authors used k-ω SST Mentermodel and observed that the CFD analysis was able to predict the bare-hull normal force co-efficient very well.

Jagadeesh*et al.* [3] did a comparative study of five turbulence models viz., AKN k-ε model, CHC k-ε model, standard k-ε model and k-ε RNG model to investigate the hydrodynamic resistance of HULL. For the studies the authors used 2-D axis symmetric model. Based on the study, they concluded that AKN k-ε model predicted the flow and near wall behavior better than other models.

Chun-yuGuo*et al.* [4] studied the steady and unsteady flow interactions of propellers, rudders and fins by RANS method with FLUENT software package. The sliding mesh model was employed to simulate unsteady interactions between the blades, rudders and fins. The RNG (Renormalized Group theory) based k-ε turbulence model is adopted. The predicted results matched well with the experimental data.

Shotaro UTO [5] carried out numerical simulation for the computation of turbulent flow around a marine propeller with RANS. The modified Baldwin-Lomax, zero equation turbulence modelswas adopted for turbulent closure. The equations were discretized by the cell-centered, finite volume and 3rd order upwind scheme. K_t and $K_q$predicted

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Numerical Simulation of a Cyclone Separator

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***Abstract*—This paper presents a numerical simulation of cyclone separator.Standard k-ω Wilcox turbulence model predicted nicely with the experiment values for solid feed rate (0.5–7.5 g/s) and cyclone inlet air velocity (9.6 – 22 m/s).The Lagrangian model predicted the path line of particles inside the cyclone by particle tracked. The percentage of deviation between the experimental and numerical analysis is 2 % to 10%. It is found that the solid exit temperature increases with the different velocity ranges (9.6 to 22 m/s) and different solid feed rate.**

***Keywords*—CFD; cyclone separator; turbulence model; velocity**

I. INTRODUCTION

Cyclone separators are the devices used in various industries to separate the air and the solid particles due to the centrifugal forces. It is also used in various chemical industries for maintaining temperature of particles inside the cyclone.

Jain *etal.*[1]carried out the experimental studies on cyclone separators and suggested that the air-solid heat transfer rate increases with increasing solid feed rate, inlet air velocity, and decreasing particle size. The average heat transfer coefficient between air and the solid particles in the cyclone was found to be essentially independent of air velocity investigated, increases with increasing particle size, and increases with increasing solid feed rate with progressively reducing rate.

Anuj Jain *et al.* [2] analysed the performance of cyclone as gas to solids heat exchanger depends on the surface area of holdup of the solid particles inside the cyclone. Unlike the conventional heat exchangers where heat transfer area is fixed for a particular heat exchanger, heat transfer area in the cyclone pre heater varies with operating parameters.

B. Wang *et al.* [3] used the Reynolds stress model to simulate the anisotropic turbulent flow in a Lapple cyclone. Its applicability was verified by the good agreement between the calculated and measured pressures and flow fields. On this basis, a stochastic Lagrangian model was used to predict the flow pattern of particles in the cyclone and its validity was confirmed by comparing the predicted and measured solid flow trajectories and collection efficiency.Liang Ma *et al.* [4]suggested that variation of inlet flow rate significantly changes the inside flowfield structure and affects separation efficiency. The increase in flow rate caused the flow field turbulence inside the separator with a diameter of 75mm to increase and generate a large vortex, which increased the back-mixing and carriage of particles at the bottom of the cone and caused a decrease in the separation efficiency of the cyclone separator. Axial velocity increased with the increase in flow rate and exhibited good symmetry. The upward axial velocity coverage clearly increased with the increase in flow rate. However, the downward axial velocity coverage decreased with the increase in flow rate.

Khairy Elsayed *et al.*[5] showed that the maximum tangential velocity in the cyclone decreases with increasing the cyclone inlet dimensions. No acceleration occurs in the cyclone space (the maximum tangential velocity was nearly constant throughout the cyclone). Increasing the cyclone inlet dimensions decreases the pressure drop. The cyclone cut-off diameter increased with increasing cyclone inlet dimension (consequently, the cyclone overall efficiency decreases due to weakness of the vortex strength). The effect of changing the inlet width was more significant than the inlet height especially for the cut-off diameter. The optimum ratio of inlet width to inlet height b/ais from 0.5 to 0.7.Jolius Gimbun *et al.*[6] predicted using CFD simulations that the cyclone cut-off size for all operating conditions had deviation of 3.7% from the experimental data. Specifically, results obtained from the computer modellingexercise had demonstrated that CFD model was the best method oftwenty different modelling of cyclones collection efficiency.Peng Qian *et al.*[8]suggested that the micro-cyclone accords with the vortex motion rules and the droplets fractional efficiency change with the inlet flow rate. Also, an efficient separation zone of theMicro-cyclonewas found.

Xue Xiaohu *et al.*[9] concluded in the simulation studies that revealed an unsteady spiral dust strand appeared near the cyclone wall and a non-axis-symmetrical dust ring appeared in the annular space and under the cover plate of the cyclone. The dimensionless concentration in the high-concentration region increased obviously in the upper part of the cyclone separation space when inlet particle loading was large. With increasing gas temperature, the particle separation ability of the cyclone was obviously weakened. As the inlet particle loading increased, the radial low-concentration region decreased and the high-concentration region increased. The dimensionless concentration in the

INVISIBILITY SYSTEM USING IMAGE PROCESSING AND OPTICALCAMOUFLAGE TECHNOLOGY

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ABSTRACT

Invisible persons are seen in fiction stories only, but inthe real world it is proved that invisibility is possible. This paper describes the creation of invisibility with the help of technologies like Optical camouflage; Image based rendering and Retro-reflective projection. The object that needs to be made transparent or invisible is painted or covered with retro reflective material. Then a projector projects the background image on it making the masking object virtually transparent. Capturing the background image requires a video camera, which sits behind the person wearing the cloak. The video from the camera must be in a digital format so it can be sent to a computer for image processing using image based rendering technical. There are some useful applications for this simple but astonishing technology.

Keywords: Optical Camouflage Technology, Retro-Reflective material, Head Mounted Projector (HMP)

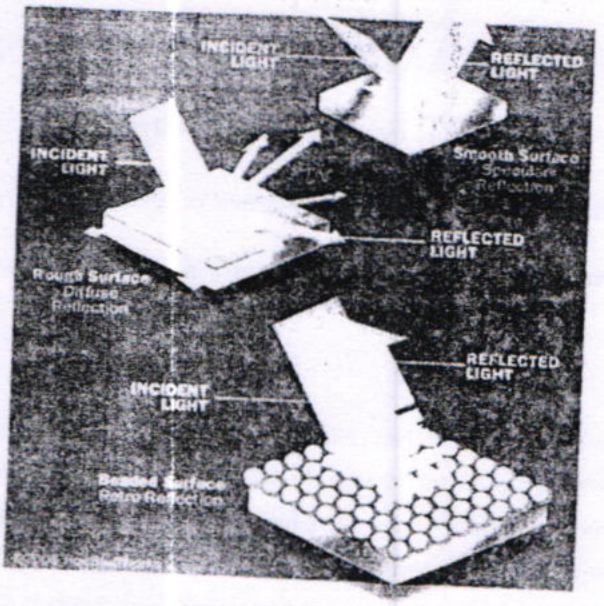
I INTRODUCTION

Optical camouflage is a kind of active camouflage. This idea is very simple. If you project background image onto the masked object, you can observe the masked object just as if it were virtually transparent. The cloak that enables optical camouflage to work is made from a special material known as **retro-reflective material**. To create invisibility or transparent illusion we need a video camera, computer, projector and a combiner.

II RETRO-REFLECTIVE MATERIAL

The cloak that enables optical camouflage to work is made from a special material known as **retro-reflective material**. A retro-reflective material is covered withthousands and thousands of small beads (Fig-1). When light strikes one of these beads, the light rays bounce back exactly in the same direction from which they came. To understand why this is unique, look at how light reflects off of other types of surfaces. A rough surface creates a diffused reflection because the incident (incoming) light rays get scattered in many different directions.

Figure-1



A perfectly smooth surface, like that of a mirror, creates what is known as a specular reflection -- a reflection in which incident light rays and reflected light rays form the exact same angle with the mirror surface. In retro-reflection, the glass beads act like prisms, bending the light rays by a process known as refraction. This causes the reflected light rays to travel back along the same path as the incident light rays. The result: An observer situated at the light source receives more of the reflected light and therefore sees a brighter reflection.

Retro-reflective materialsare actually quite common.Traffic signs, road markers and bicycle reflectors all take advantage of retro-reflection to be more visible to people driving at night. Movie screens used in most modern commercial theaters also take advantage of this material because it allows for high brilliance under dark conditions. In optical camouflage, the use of retro-reflective material is critical because it can be seen from far away and outside.

III THE VIDEO CAMERA AND COMPUTER

i). Video Camera

The retro-reflective garment doesn't actually make a person invisible -- in fact, it's perfectly opaque. What the garment does is create an illusion of invisibility by acting like a movie screen onto which an image from the background is projected. Capturing the background image requires a video camera, which sits behind the person wearing the cloak. The video from the camera must be in a digital format so it can be sent to a computer for processing.

ii). Computer

All augmented-reality systems rely on powerful computers to synthesize graphics and then superimpose them on a real-world image. For optical camouflage to work, the hardware/software combo must take the captured

image from the video camera, calculate the appropriate perspective to simulate reality and transform the captured image into the image that will be projected onto the retro-reflective material. This technic of image processing is called image based rendering.

IV THE PROJECTOR AND COMBINERI)

i) The Projector

The modified image produced by the computer must be shone onto the garment. which acts like a movie screen. A projector accomplishes this task by shining a light beam through an opening controlled by a device called an **iris diaphragm**. An iris diaphragm is made of thin, opaqueplates, and turning a ring changes the diameter of the central opening. For optical camouflage to work properly, this opening must be the size of a pinhole. Why? This ensures a larger depth of field so that the screen (in this case the cloak) can be located any distance from the projector.

ii). The Combiner

The system requires a special mirror to both reflect the projected image toward the cloak and to let light rays bouncing off the cloak return to the user's eye. This special mirror is called a beam splitter, or a combiner -- a half-silvered mirror that both reflects light (the silvered half) and transmits light (the transparent half). If properly positioned in front of the user's eye, the combiner allows the user to perceive both the image enhanced by the computer and light from the surrounding world. This is critical because the computer-generated image and the real-world scene must be fully integrated for the illusion ofinvisibility to seem realistic. The user has to look through a peephole in this mirror to see the augmented reality

V THE COMPLETE SYSTEM

Now let's put all of these components together to see how the invisibility cloak appears to make a person transparent. The given figure-2 shows the typical arrangement of all of the various devices and pieces of equipment.

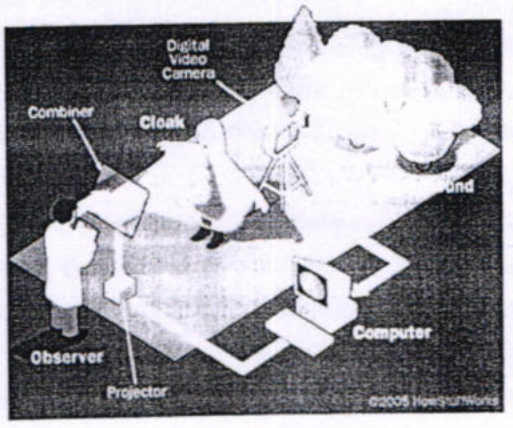


Figure-2

Once a person puts on the cloak made with the retro-reflective material, here's the sequence of events:

1. A digital video camera captures the scene behind the person wearing the cloak.
2. The computer processes the captured image and makes the calculations necessary to adjust the still image or video so it will look realistic when it is projected.
3. The projector receives the enhanced image from the computer and shines the image through a pinhole-sized opening onto the combiner.
4. The silvered half of the mirror, which is completely reflective, bounces the projected image toward the person wearing the cloak.
5. The cloak acts like a movie screen, reflecting light directly back to the source, which in this case is the mirror.
6. Light rays bouncing off of the cloak pass through the transparent part of the mirror and fall on the user's eyes. Remember that the light rays bouncing off of the cloak contain the image of the scene that exists behind theperson

wearing the cloak. The person wearing the cloak appears invisible because the background scene is being displayed onto the retro-reflective material. At the same time, light rays from the rest of the world are allowed reach the user's eye, making it seems as if an invisible person exists in an otherwise normal-looking world.

VI HEAD-MOUNTED DISPLAYS

Of course, making the observer stand behind a stationary combiner is not very pragmatic -- no augmented-reality system would be of much practical use if the user had to stand in a fixed location. That's why most systems require that the user carry the computer on his or her person, either in a backpack or clipped on the Hip. It's also why most systems take advantage of head-mounted displays, or HMDs, which assemble the combiner and optics in a wearable device.

There are two types of HMDs: optical see-through displays and video see-through displays. Optical see-through displays look like high-tech goggles, sort of like the goggles Cyclops wears in the X-Men comic books and movies. These goggles provide a display and optics for each eye, so the user sees the augmented reality in stereo. **Video see-through displays**, on the other hand, use video-mixing technology to combine the image from a head-worn camera with computer-generated graphics.

In this arrangement, video of the real world is mixed with synthesized graphics and then presented on a liquid-crystal display. The great advantage of video see-through displays is that virtual objects can fully obscure real-world objects and vice versa.

The scientists who have developed optical-camouflage technology are currently perfecting a variation of a video see-through display that brings together all of the components necessary to make the invisibility cloak work. They call their apparatus a **head-mounted projector** (HMP) because the projection unit is an integral part of the helmet. Two projectors one for each eye are required to produce a stereoscopic effect.

VII REAL-WORLD APPLICATIONS

While an invisibility cloak is an interesting application of optical camouflage, it's probably not the most useful one. Here are some practical ways the technology might be applied.

Pilots landing a plane could use this technology to make cockpit floors transparent. This would enable them to see the runway and the landing gear simply by glancing down.

Doctors performing surgery could use optical camouflage to see through their hands and instruments to the underlying tissue. See Tachi Lab: Optical Camouflage: oc-phantom.mpg to watch a video of how this might work.

Providing a view of the outside in windowless rooms is one of the more fanciful applications of the technology, but one that might improve the psychological well-being of people in such environments.

Drivers backing up cars could benefit one day from optical camouflage. A quick glance backward through a transparent rear hatch or tailgate would make it easy to know when to stop.

VIII SOME IMAGES SHOWING INVISIBILITY

IX CONCLUSION

This amazing technology creates objects or human beings invisible or transparent. Though it has some limitations, it won't be for long as scientists continue to push the boundaries of the technology. One of the most promising applications of this technology, however, has less to do with making objects invisible and more about making them visible. The concept is called **Mutual Telexistence**: working and perceiving with the feeling that you are in several places at once. **Pervasive gaming** is another application where players with mobile displays move through the world while sensors capture information about their environment, including their location. This information is used to deliver users a gaming experience that changes according to where they are and what they are doing.

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Increasing Efficiency Of Mobile Sink WSN Using Global Best Positioning Mechanism

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Abstract— **Moving sink leads to the route breakage from node to sink. Routing recovery has to be done fast and effectively. The Immune Orthogonal Learning Particle Swarm Optimization Algorithm (IOLPSOA) can enhance the system with speedier global merging and higher course recuperation because of the development of the sink. In this venture I propose another system where there will be various sink in a WSN and sinks are conveyed with needs. Sinks in the sensing field work based to the need. At a specific time stand out sink will be in movement which has most elevated need around then and it will discover the Global best position (GBP) and moves towards it. The sink will get the data about the GBP by gathering data about the nodes in the system. With the assistance of that data from the sensor nodes the sink will compute the GBP and way to move there. At the point when the sink will drain its energy to particular level of its vitality then it will send appeal to the following most astounding need sink which will be static. When second sink gets the solicitation from the exhausted sink, it will begin moving towards the drained sink and takes its position slowly. This new sink will gather the obliged information from the close-by nodes until and unless the drained sink bites the dust to the movement of the sink breakage of inter nodes routes takes place, therefore the routing recovery is a critical challenge.**

Keywords — **Global Best Positioning, IOLPSOA, mobile sink, routing recovery, wireless sensor networks.**

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have assumes critical part of the Internet of Things (IoT) are utilized as a part of numerous profits as far and wide as possible, for example, spring of gushing lava and fire checking, urban sensing, to discover uncommon creature and border observation. In the WSNs, a sink is characterized as an element that gathers information from the sensors in the sensing field. With the improvement of 3G telephones, versatile PDAs and other handheld gadgets, more applications need to coordinate sink node. With the assistance of these gadgets, portable sink is expected to satisfy the necessity.

A portable sink can possibly proceed with the system's lifetime by utilizing lower vitality of the sensor nodes near to sink because of its evolving positions. Web is extending its scope to this present reality through developments on the whole termed the Internet of Things. The IoT interfaces a mixed bag of access gadgets with the portable system and Internet, and uses the examined sensor information to furnish clients with numerous particular administrations, for example, remote restorative consideration and astute transportation framework. Remote sensor systems (WSNs) have assumed an essential part of IoT because of the powerlessness of gathering information from nature and reporting them back to a sink. In the WSNs, a sink is characterized as a client that gathers the information reported from the system, for example, PDAs and robots furnished with remote gadgets. With the improvement of 3G telephones, portable PDAs and the handheld gadgets, more applications need to coordinate sink node with these gadgets, consequently portability of sink is needed. In these applications, the vast majority of the nodes stay static while sinks are portable. It has been exhibited that a versatile sink can possibly build the system's lifetime by bringing about lower devouring vitality of the sensor nodes near to the sink because of its evolving positions.

Portable sink can bit by bit proceed with the system's lifetime by utilizing lower vitality of the sensor nodes near to sink because of its evolving positions. In Mobile sink at whatever point make way from the source node to versatile sink is broken because of the sink versatility, steering recuperation messages would be traded to structure an option way. So as to manufacture an option way from the source node to the sink data gave by the past way is utilized. This system builds the correspondence overhead and subsequently decreases the system execution regarding postponement and vitality utilization.

A Particle Swarm Based steering recuperation strategy is to address the issue of information conveyance from the sources to the portable sink.

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PSOA conforms its flying way as indicated by its close to home best experience and global best experience. Offer a speedier global union and higher arrangement quality and enhances system execution .As we know, Particle Swarm Optimization Algorithm (PSOA) hunt down an ideal arrangement through every particle flying in the pursuit space and flying direction is balanced by individual best and global best experience [2]. Owing to its basic calculation structure and high productivity, PSOA has turned into a broadly received improvement system.

Particle Swarm Optimization Algorithm (PSOA) was enhanced by utilizing the agreeable conduct of numerous swarms and Cooperative Particle Swarm Optimization Algorithm (CPSOA) was made. In CPSOA impediment of a particle is repaid by all different particles. At that point Orthogonal Learning Particle Swarm Optimization Algorithm (OLPSOA) was created to guide the particle to fly towards the global ideal all the more relentlessly. OLPSOA got modified to IOLPSOA by including the safe system [7]. This will give more differences to the calculation. I am utilizing Immune Orthogonal Learning Particle Swarm Optimization Algorithm for directing recuperation. It gives proficient course repair to topology changed by the sink development, correspondence overhead is decreased and WSNs lifetime is expanded.

II. Existing Systems

IOLPSOA calculation is utilized to address the steering issue of information transmission from sources to the versatile sink. IOLPSOA utilizes fundamentals of Particle Swarm Optimization Algorithm. In PSOA scan for an ideal arrangement through every particle flying in the hunt space and conforming its flying direction as indicated by its close to home best experience and global best experience is carried out. Owing to its basic structure and high productivity, the PSOA has ended up broadly received advancement procedure.

The particle may endure the marvel that a few measurements of the arrangement vector may be enhanced by one model or crumbled by the other model, and lead to undesired neighbourhood ideal [2]. Henceforth, how to find more valuable data to develop a promising and effective model to guide the particle flying relentlessly towards the global ideal district is a testing issue.

In this framework nodes will be static and sink will be portable. Because of sink versatility course from sink to source node will break.

Directing recuperation ought to be carried out. For steering recuperation first sink will send get node solicitation to all nodes in the system. In the wake of gathering data from the nodes sink will utilize Immune Orthogonal Learning Particle Swarm Optimization Algorithm for steering recuperation. In this calculation firstly position and speed of nodes are overhauled time to time which will help for the sink development [1]. Sink will choose the nodes which are proper for the course development. In the wake of selecting the nodes sink will perform the inoculation venture to discover resistance of nodes in course arrangement.

In vaccination venture of IOLPSOA every particle can be considered as an immune response, it delivers posterity by cloning, expands differing qualities in the inquiry prepare by transformation, kills the wrong particle by resistant concealment and stores the proper arrangement through safe memory. Just safe nodes are considered for course arrangement and different nodes are ended. In the IOLPSOA, flying bearing of the particle (neutralizer) is advanced by the OL technique and its differences are expanded for the most part by insusceptible instrument.

A. *Advantages*

- Routing recuperation from way disappointment is quick.
- Offers speedier global meeting and higher arrangement quality.
- Routing convention in portable sink is enhanced by utilizing IOLPSOA.

B. *Disadvantages*

- Here the regular data redesigns and correspondence overheads would expend extreme battery vitality of the nodes, and abbreviate the system lifetime.
- The AODV and other traditional conventions dependably give global system way recuperation with high correspondence overheads.
- The current instrument lessens the system execution as far.

III. Proposed System

In proposed framework taking into account the quantity of the nodes various sinks are conveyed. Needs will be appointed to all the sinks and in light of the need sink will work. Initially need sink will be moving and different sinks will be static specifically position.

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Sink 1 which is portable will send the get node bundle which contains the sink id to the nodes in 1 bounce separation to gather data of those nodes. In the wake of getting the get node demand nodes will send data like position, vitality level, and information sort and errand table of that node to the sink. Nodes which have got get node solicitation will pass the appeal to its neighbour nodes. What's more, gather neighbour node data and pass it to the sink.

When gathering data from all the obliged nodes sink will figure the global best position (GBP). Global best position is the position where the transmission rate is higher and vitality utilization is less. For the figuring of the global best position sink will gather data from the nodes that is clear places in the system. In the wake of getting this data sink will compute specific clear position where most extreme transmission rate, low vitality utilization and having briefest way from greatest nodes.

Sink will figure the way to move towards global best position. Sink will then make the course with the nodes for information transmission. For this directing immune orthogonal learning particle swarm calculation is utilized.

When sink which is collecting the data that sink's energy depletes then another sink will replace and it will carry out its work. Global best position will be changing in light of the time and remaining vitality in the nodes. So sink will be gathering the data from the nodes specifically time and by staying informed regarding this data GBP will be upgraded. By this strategy vitality utilization can be decreased and system lifetime is expanded.

IV. System Design

In the first place procedure is sending of nodes which are static. In light of the quantity of nodes numerous portable sinks are sent. Sink is divided based on priority. Sink will gather all the obliged data from the nodes and will be utilized for course recuperation. Correspondence in the middle of sink and node will be carried out and all nodes data will be gathered by sink for GBP count. Correspondence in the middle of sink and node is carried out by sending GN parcel and getting GNR bundle [4].

Global Best Position is computed. GBP position is the position where transmission rate will be high and vitality utilization is less. While deciding GBP likewise sink will be gathering data from the nodes and for this steering is needed. For steering reason IOLPSO calculation is utilized which gives the proficient directing recuperation.

As there will be a sink development breakage of course will be there and IOLPSO calculation is utilized for directing recuperation. At that point sink will track the course to the GBP and it goes to that specific position. When sink is in GBP steering is carried out again to the source node and information is gathered. Sink will be moving in the characterized way, when sink's vitality exhausts it sends appeal to the second sink to supplant it and second sink will gather obliged data from first sink and replaces it. Like this the system vitality will be spared.

A. Deployment of nodes and sinks

In the first place in the node arrangement transform, the asked for node needs to send an appeal to the principle node with the assistance of the attachment programming. The Server Socket Part of the fundamental node should get the appeal which is sent from the asked for node then it redesigns the ip and port that has been relegate to that asked for client. The new port which is for the regarded node is sent back to the node and the node runs a server attachment with the new port and consequently the node gets conveyed.

In the Sink instrument the sink sends its own ip address and port number and afterward that data is sent to the fundamental node. A listening string for the sink is running on the foundation keeping in mind the end goal to get the solicitation sent from the sink. So the listening string gets the ip and port sent from the sink and after that it expands the port and after that the upgraded port number is sent back to the sink. The sink in the wake of accepting the port number begins another string that listens on the new port number sent from the Main node.

B. Node Sink Communication

Sink will gather data from the nodes by sending GN to the nodes in 1 jump separation. Those nodes will forward GN to its neighboring nodes and gathers data from them like assignment table, id, and vitality data. Node will send GNR back to the sink containing data about itself and its neighboring nodes [1]. In view of this data sink will compute GBP and way towards GBP.

Algorithm 1: Collecting node data.

Step 1: When the moving sink is separated it sends the GN bundle containing the errand table. The node got the GN increments from m to m+1 and transfers the bundle to its neighbors.

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Step 2: If a node got GN is a node on the past way, it reacts the GNR containing its neighbor table and errand table.

Step 3: The sink gathers all the data of the nodes which have transmitted GNR, and overhauls its neighbor table. At that point, the sink figures and develops the ideal option way.

Step 4: The sink shows the parcel GNR_ACK containing current data. At whatever point a node gets it, it checks whether its ID is in the undertaking table. At that point it secures the association with sink.

C. GBP Determination

Sink will ascertain the global best position with all the gathered data where the execution of the system is grinding away's best. Sink will store all the data from the nodes in a table. Firstly sink will discover the nodes which have the most extreme number of neighbor nodes.

It will get such nodes and figure out the transmission of those nodes and finds the convergence of greatest transmission range. In the event that that converging focuses are more than one then it will check which indicate is closer the sink and which has low vitality utilization and it will get it as a Global Best Position.

Algorithm 2: Getting best position

Step 1: Sink stores data from all the nodes and stores it in the table.

Step 2: Sink chooses the node which have the most extreme number of neighbor nodes.

*Step 3:*Then sink will figure the meeting purpose of transmission extent.

Step 4: If more than one crossing focuses are there then sink will check the point which is closest and less vitality devouring

Step 5: By taking all these criteria the GBP is computed and sink will get the global best position.

C. Tracking to GBP

In this step sink in the wake of getting the GBP will track the way towards that position. Also, move in such a route, to the point that it achieves the GBP productively.

D. Sink Replacement

The sink will be moving in the characterized way, when sink's vitality drains it sends appeal to the second sink to supplant it and second sink will gather obliged data from first sink and replaces it. Like this the system vitality will be spared.

V. RESULTS

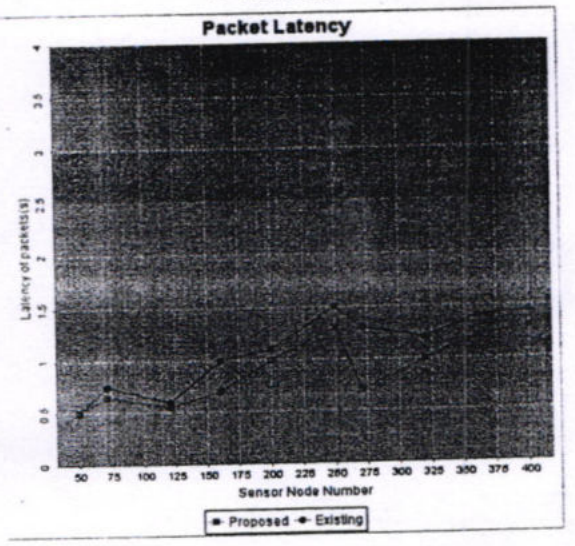

Fig. 1. Packet Latency

The inactivity of parcel conveyance from source to the sink is given in above chart. X-pivot speaks to the quantity of sensor nodes in the system and y-hub is the normal information parcel conveyance dormancy. Due to the expansion of time many-sided quality of the proposed component, the normal idleness of parcel conveyance of the IOLPSOA is less as looked at. Anyhow as the system scale develops, new instrument has exhibited a lower inactivity pattern of bundles conveyance than alternate conventions.

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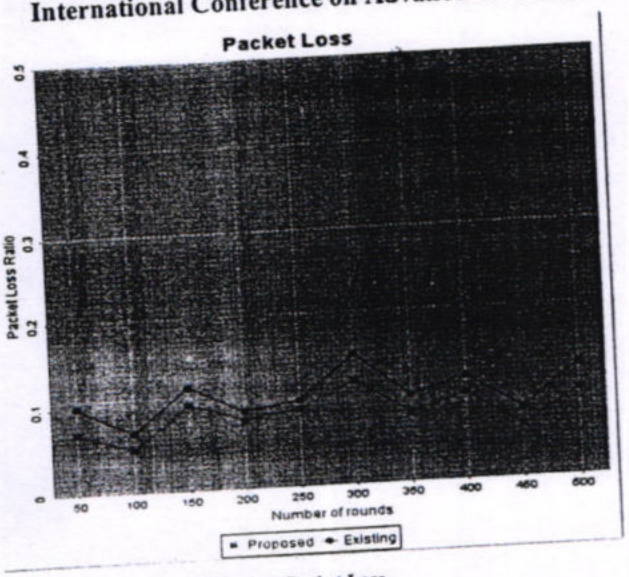

Fig. 2. Packet Loss

The proposed component gives a quick directing recuperation from way disappointment. At whatever point the way is broken because of the sink development recuperation ought to be carried out as quick as could be expected under the circumstances. Postpone in the directing recuperation implies more parcel misfortune. New component gives a quick steering recuperation and parcel misfortune is lessened effectively.

VI. CONCLUSIONS

In this paper by ascertaining the GBP and moving sink to the GBP vitality utilization of the system is diminished and lifetime is expanded.

GBP of the sink will be changing and specifically interim it is figured once more. IOLPSO calculation likewise gives a vitality effective directing recuperation. Sink development enhances the productivity by supplanting the exhausted sink and along these lines system lifetime is expanded. So by this all general system lifetime and system productivity is expanded.

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Hyperbolic Tangent Fluid Flow Through A Porous Medium in an Inclined Channel with Peristalsis

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Abstract

In the present analysis, we investigated the peristaltic transport of a hyperbolic tangent fluid through a porous medium in a two-dimensional symmetric inclined channel under the assumptions of low Reynolds number and long wavelength. The expression for the velocity and axial pressure gradient are obtained by employing regular perturbation technique. It is observed that the pumping is less for hyperbolic tangent fluid than that of Newtonian fluid. The effects of various pertinent parameters on the time-averaged flow rate are discussed with the help of graphs.

Keywords: Hyperbolic tangent fluid, Symmetric inclined channel, Porous medium

1. Introduction

Peristaltic transport is a form of fluid transport generated by a progressive wave of area contraction or expansion along a length of a distensible tube containing fluid. Peristaltic transport widely occurs in many biological systems for example, food swallowing through the esophagus, intra-urine fluid motion, circulation of blood in small blood vessels and the flows of many other glandular ducts. Several theoretical and experimental studies have been undertaken to understand peristalsis through abrupt changes in geometry and realistic assumptions. Peristaltic transport of Newtonian fluids has been studied by Fung and Yih (1968), Shapiro et al. (1969) and Subba Reddy et al. (2005) under different conditions. Moreover, it is well known that most physiological fluids including blood behave as non-Newtonian fluids. So, the study of peristaltic transport of non-Newtonian fluids may help to get better understanding of the working biological systems. Fluids in which viscosity depends on the shear stress or on the flow rate are of considerable practical importance and is considered as special class of fluids. For most of the non-Newtonian fluids, viscosity is usually a nonlinear decreasing function of the generalized shear rate. This is known as shear-thinning behavior. Such fluid is a hyperbolic tangent fluid (Ai and Vafai (2005)). The peristaltic flow of a hyperbolic tangent fluid in an asymmetric channel was discussed by Nadeem and Akram (2009). Nadeem and Akram (2011) have analyzed the effect of magnetic field on the peristaltic motion of a hyperbolic tangent fluid in a vertical asymmetric channel with heat transfer. The peristaltic transport of a Tangent hyperbolic fluid in an endoscope numerically was investigated by Nadeem and Akbar (2011). Akbar et al. (2012) have studied the effects of slip and heat transfer on the peristaltic transport of a hyperbolic tangent fluid in an inclined asymmetric channel.

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A porous medium is the matter which contains a number of small holes distributed throughout the matter. Flows through a porous medium occur in filtration of fluids. Hall effects on peristaltic flow of a Maxwell fluid in a porous medium were investigated by Hayat et al. (2007). El-Dabe et al. (2010) have discussed the effect of magnetic field on the peristaltic motion of a Carreau fluid through a porous medium with heat transfer. Navaneeswar Reddy et al. (2012) have analyzed the peristaltic flow of a Prandtl fluid through a porous medium in a channel. Peristaltic pumping of a fourth grade fluid through a porous medium in an asymmetric channel was investigated by Jyothi et al. (2012). Subba Reddy and Nadhamuni Reddy (2014) have studied the peristaltic flow of a non-Newtonian fluid through a porous medium in a tube with variable viscosity using Adomian decomposition method.

In view of these, we investigated the peristaltic transport of a hyperbolic tangent fluid through a porous medium in an inclined channel under the assumptions of low Reynolds number and long wavelength. The expression for the velocity and axial pressure gradient are obtained by employing perturbation technique. The effects of various pertinent parameters on the time-averaged flow rate are discussed with the help of graphs.

2. MATHEMATICAL FORMULATION

We consider the peristaltic motion of a hyperbolic tangent fluid through a porous medium in a two-dimensional symmetric channel of width . The flow is generated by sinusoidal wave trains propagating with constant speed along the channel walls. The channel walls are inclined at an angle to the horizontal. Fig. 1 shows the schematic diagram of the channel. The wall deformation is given by

$$Y = \pm H(X,t) = \pm a \pm b \sin \frac{2\pi}{\lambda}(X - ct) \qquad (1)$$

where b is the amplitude of the wave, λ - the wave length and X and Y - the rectangular co-ordinates with X measured along the axis of the channel and Y perpendicular to X . Let (U,V) be the velocity components in fixed frame of reference (X,Y) .

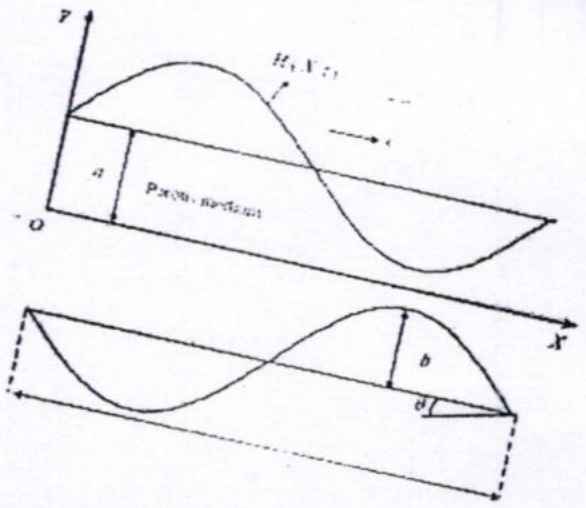

Fig. 1 The physical model

The flow is unsteady in the laboratory frame . However, in a co-ordinate system moving with the propagation velocity c (wave frame (x, y)), the boundary shape is stationary. The transformation from fixed frame to wave frame is given by

$$x = X - ct, y = Y, u = U - c, v = V \qquad (2)$$

where (u,v) and (U,V) are velocity components in the wave and laboratory frames respectively. The constitutive equation for a Hyperbolic Tangent fluid is

$$\tau = -\left[\eta_\infty + (\eta_0 + \eta_\infty)\tanh(\Gamma\dot{\gamma})^n\right]\dot{\gamma} \qquad (3)$$

where τ is the extra stress tensor, η_∞ is the infinite shear rate viscosity, η_0 is the zero shear rate viscosity, Γ is the time constant, n is the power-law index and $\dot{\gamma}$ is defined as

$$\dot{\gamma} = \sqrt{\frac{1}{2}\sum_i\sum_j \dot{\gamma}_{ij}\dot{\gamma}_{ji}} = \sqrt{\frac{1}{2}\pi} \qquad (4)$$

where π is the second invariant stress tensor. We consider in the constitutive equation (3) the case for which $\eta_\infty = 0$ and $\Gamma\dot{\gamma} < 1$, so the Eq. (3) can be written as

$$\tau = -\eta_n (\Gamma\dot{\gamma})^n \dot{\gamma} = -\eta_n (1 + \Gamma\dot{\gamma} - 1)^n \dot{\gamma} = -\eta_n \left(1 + n\left[\Gamma\dot{\gamma} - 1\right]\right)\dot{\gamma} \quad (5)$$

The above model reduces to Newtonian for $\Gamma = 0$ and $n = 0$.

The equations governing the flow in the wave frame of reference are

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \quad (6)$$

$$\rho\left(u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y}\right) = -\frac{\partial p}{\partial x} - \frac{\partial \tau_{xx}}{\partial x} - \frac{\partial \tau_{xy}}{\partial y} - \left(\frac{\eta_n}{k}\right)(u + c) + \rho g \sin\theta \quad (7)$$

$$\rho\left(u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y}\right) = -\frac{\partial p}{\partial y} - \frac{\partial \tau_{xy}}{\partial x} - \frac{\partial \tau_{yy}}{\partial y} - \frac{\eta_n}{k}v - \rho g \cos\theta \quad (8)$$

where ρ is the density σ is the electrical conductivity, B_0 is constant transverse magnetic field and k is the permeability of the porous medium. The corresponding dimensional boundary conditions are

$$u = -c \qquad \text{at} \qquad y = H \quad (9)$$

$$\frac{\partial u}{\partial y} = 0 \qquad \text{at} \qquad y = 0 \quad (10)$$

Introducing the non-dimensional variables defined by

$$\bar{x} = \frac{x}{\lambda},\ \bar{y} = \frac{y}{a},\ \bar{u} = \frac{u}{c},\ \bar{v} = \frac{v}{c\delta},\ \delta = \frac{a}{\lambda},\ \bar{p} = \frac{pa^2}{\eta_n c\lambda},\ \phi = \frac{h}{a}$$

$$h = \frac{H}{a},\ \bar{t} = \frac{ct}{\lambda},\ \bar{\tau}_{xx} = \frac{\lambda}{\eta_n c}\tau_{xx},\ \bar{\tau}_{xy} = \frac{a}{\eta_n c}\tau_{xy},\ \bar{\tau}_{yy} = \frac{\lambda}{\eta_n c}\tau_{yy},$$

$$\mathrm{Re} = \frac{\rho a c}{\eta_n},\ We = \frac{\Gamma c}{a},\ \bar{\dot{\gamma}} = \frac{\dot{\gamma} a}{c},\ \bar{q} = \frac{q}{ac} \quad (11)$$

into the Equations (6) - (8), reduce to (after dropping the bars)

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \quad (12)$$

$$\mathrm{Re}\,\delta\left(u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y}\right) = -\frac{\partial p}{\partial x} - \delta^2\frac{\partial \tau_{xx}}{\partial x} - \frac{\partial \tau_{xy}}{\partial y} - \frac{1}{Da}(u + 1) + \frac{\mathrm{Re}}{Fr}\sin\theta \quad (13)$$

$$\mathrm{Re}\,\delta^2\left(u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y}\right) = -\frac{\partial p}{\partial y} - \delta^2\frac{\partial \tau_{xy}}{\partial y} - \delta\frac{\partial \tau_{yy}}{\partial y} - \frac{\delta^2}{Da}v - \delta\frac{\mathrm{Re}}{Fr}\cos\theta \quad (14)$$

where $\tau_{xx} = -2\left[1 + n\left(We\dot{\gamma} - 1\right)\right]\dfrac{\partial u}{\partial x}$,

$$\tau_{xy} = -\left[1 + n\left(We\dot{\gamma} - 1\right)\right]\left(\frac{\partial u}{\partial y} + \delta^2\frac{\partial v}{\partial x}\right)$$

$$\tau_{yy} = -2\delta\left[1 + n\left(We\dot{\gamma} - 1\right)\right]\frac{\partial v}{\partial y}$$

$$\dot{\gamma} = \left[2\delta^2\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial u}{\partial y} + \delta^2\frac{\partial v}{\partial x}\right)^2 + 2\delta^2\left(\frac{\partial v}{\partial y}\right)^2\right]^{\frac{1}{2}}$$

$Fr = \dfrac{c^2}{ag}$ is the Froude number, and $Da = \dfrac{k}{a^2}$ is the Darcy number.

Under lubrication approach, neglecting the terms of order δ and Re, the Equations (13) and (14) become

$$\frac{\partial p}{\partial x} = \frac{\partial}{\partial y}\left\{\left[1 + n\left(We\frac{\partial u}{\partial y} - 1\right)\right]\frac{\partial u}{\partial y}\right\} - \frac{1}{Da}(u + 1) + \frac{\mathrm{Re}}{Fr}\sin\theta \quad (15)$$

$$\frac{\partial p}{\partial y} = 0 \quad (16)$$

From Eq. (15) and (16), we get

$$\frac{dp}{dx} = (1 - n)\frac{\partial^2 u}{\partial y^2} + nWe\frac{\partial}{\partial y}\left[\left(\frac{\partial u}{\partial y}\right)^2\right] - \frac{1}{Da}(u + 1) + \frac{\mathrm{Re}}{Fr}\sin\theta \quad (17)$$

The corresponding non-dimensional slip boundary conditions in the wave frame are given by

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$$u = -1 \text{ at } \quad y = h = 1 + \phi \sin 2\pi x \tag{18}$$

$$\frac{\partial u}{\partial y} = 0 \quad \text{at} \quad y = 0 \tag{19}$$

The volume flow rate q in a wave frame of reference is given by

$$q = \int_0^h u\,dy\,. \tag{20}$$

The instantaneous flow $Q(X,t)$ in the laboratory frame is

$$Q(X,t) = \int_0^h U\,dY = \int_0^h (u+1)\,dy = q + h \tag{21}$$

The time averaged volume flow rate $\overline{Q}$ over one period $T\left(=\frac{\lambda}{c}\right)$ of the peristaltic wave is given by

$$\overline{Q} = \frac{1}{T}\int_0^T Q\,dt = q + 1 \tag{22}$$

3. SOLUTION

Since Eq. (17) is a non-linear differential equation, it is not possible to obtain closed form solution. Therefore we employ regular perturbation to find the solution.

For perturbation solution, we expand u, $\frac{dp}{dx}$ and q as follows

$$u = u_0 + We\,u_1 + O\left(We^2\right) \tag{23}$$

$$\frac{dp}{dx} = \frac{dp_0}{dx} + We\frac{dp_1}{dx} + O\left(We^2\right) \tag{24}$$

$$q = q_0 + We\,q_1 + O\left(We^2\right) \tag{25}$$

Substituting these equations into the Eqs. (17) - (19), we obtain

3.1. System of order We^0

$$(1-n)\frac{\partial^2 u_0}{\partial y^2} - \frac{1}{Da}u_0 = \frac{dp_0}{dx} - \frac{\mathrm{Re}}{Fr}\sin\theta + \frac{1}{Da} \tag{26}$$

and the respective boundary conditions are

$$u_0 = -1 \quad \text{at} \quad y = h \tag{27}$$

$$\frac{\partial u_0}{\partial y} = 0 \quad \text{at} \quad y = 0 \tag{28}$$

3.2. System of order We^1

$$(1-n)\frac{\partial^2 u_1}{\partial y^2} - \frac{1}{Da}u_1 = \frac{dp_1}{dx} - \frac{\partial}{\partial y}\left[\left(\frac{\partial u_0}{\partial y}\right)^2\right] \tag{29}$$

and the respective boundary conditions are

$$u_1 = 0 \quad \text{at } y = h \tag{30}$$

$$\frac{\partial u_1}{\partial y} = 0 \text{ at } y = 0 \tag{31}$$

3.3 Solution for system of order We^0

Solving Eq. (26) using the boundary conditions (27) and (28), we obtain

$$u_0 = \frac{1}{\Omega^2(1-n)}\left(\frac{dp_0}{dx} - \frac{\mathrm{Re}}{Fr}\sin\theta\right)\left[\frac{\cosh\Omega y}{\cosh\Omega h} - 1\right] - 1 \tag{32}$$

where $\Omega = 1/\sqrt{Da(1-n)}$

The volume flow rate q_0 is given by

$$q_0 = \frac{1}{\Omega^2(1-n)}\left(\frac{dp_0}{dx} - \frac{\mathrm{Re}}{Fr}\sin\theta\right)\left[\frac{\sinh\Omega h - \Omega h\cosh\Omega h}{\Omega\cosh\Omega h}\right] - h \tag{33}$$

From Eq. (33), we have

Da with $\phi = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$, $n = 0.5$ and $We = 0.01$ is shown in Fig. 4. It is noted that, the time-averaged volume flow rate $\overline{Q}$ decreases with increasing Da in the pumping region, while it increases with increasing Da in both the free-pumping and co-pumping regions.

Fig. 5 shows the variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of Re with $\phi = 0.5$, $Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.01$. It is found that, the time-averaged volume flow rate $\overline{Q}$ increases with increasing Re in all the three regions.

The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of Fr with $\phi = 0.5$, $Da = 0.1$, $n = 0.5$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $We = 0.02$ is shown in Fig. 6. It is observed that, the time-averaged volume flow rate $\overline{Q}$ decreases with increasing Fr in all the three regions.

Fig. 7 depicts the variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of θ with $\phi = 0.5$, $Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.02$. It is noted that, the time-averaged volume flow rate $\overline{Q}$ increases with increasing θ in all the three regions.

The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of ϕ with $\mathrm{Re} = 1$, $Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.02$ is depicted in Fig. 8. It is found that, the time-averaged volume flow rate $\overline{Q}$ increases with an increase in ϕ in both the pumping and free-pumping regions, while it decreases with increasing ϕ in the co-pumping region for chosen $\Delta p\,(< 0)$.

5. CONCLUSIONS

In this paper, we studied the peristaltic flow of a hyperbolic tangent fluid through a porous medium in a planar channel under the assumptions of low Reynolds number and long wavelength. The expression for the velocity and axial pressure gradient are obtained by employing perturbation technique. It is observed that, in the pumping region the time-averaged flow rate $\overline{Q}$ increases with increasing We, Re, θ and ϕ, while it decreases with increasing n, Da and Fr. Moreover, it is observed that the pumping is less for hyperbolic tangent fluid than that of Newtonian fluid.

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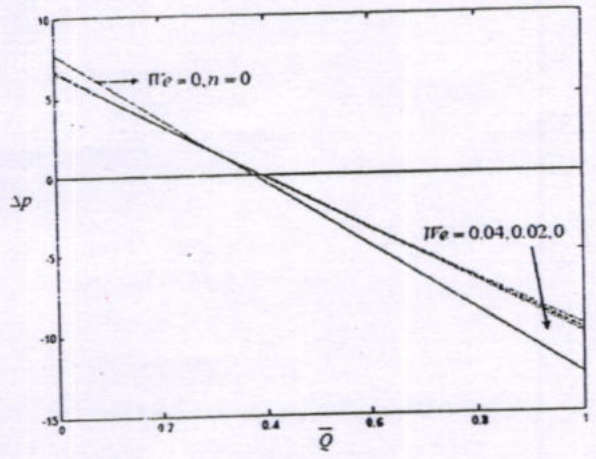

Fig. 2 The variation of pressure rise Δp with time-averaged volume flow rate $\bar{Q}$ for different values of We with $\phi = 0.5$, $n = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $Da = 0.1$.

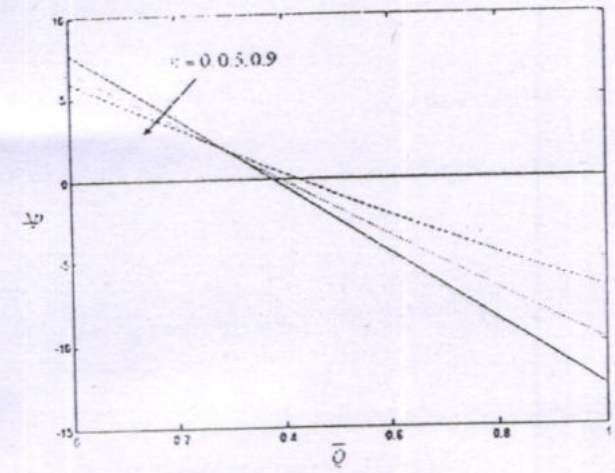

Fig. 3 The variation of pressure rise Δp with time-averaged volume flow rate $\bar{Q}$ for different values of n with $\phi = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$, $We = 0.02$ and $Da = 0.1$.

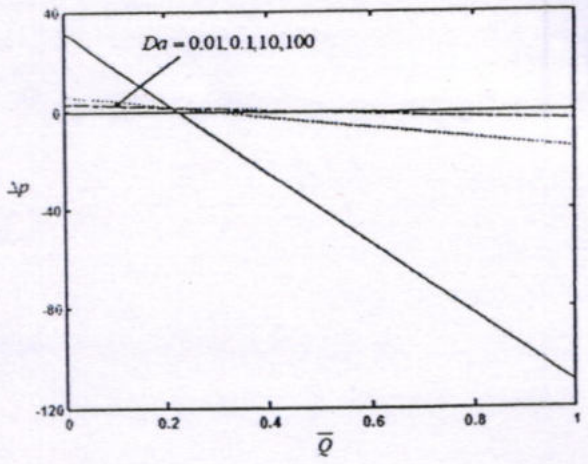

Fig. 4 The variation of pressure rise Δp with time-averaged volume flow rate $\bar{Q}$ for different values of Da with $\phi = 0.5$, $n = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $We = 0.02$.

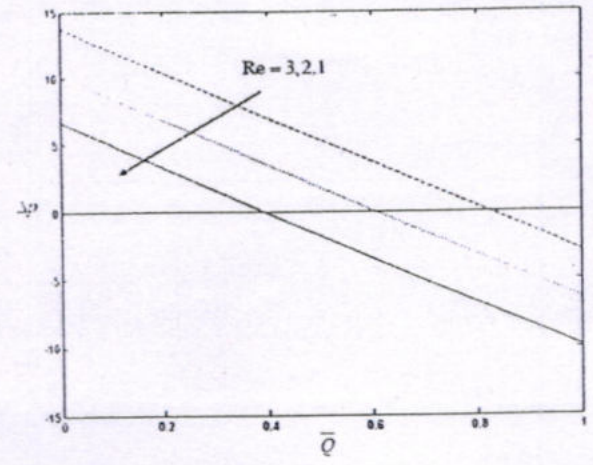

Fig. 5 The variation of pressure rise Δp with time-averaged volume flow rate $\bar{Q}$ for different values of Re with $\phi = 0.6$, $Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.01$.

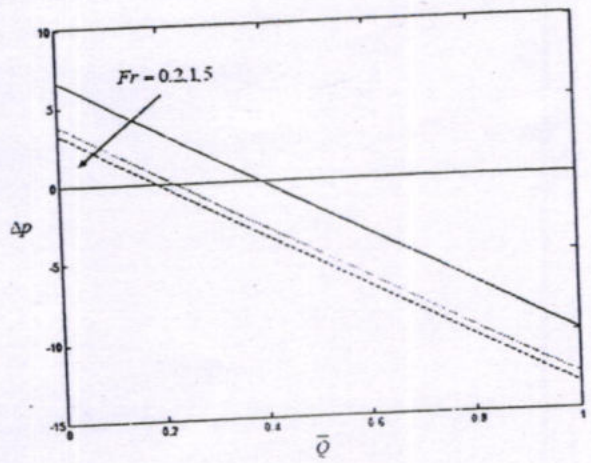

Fig. 6 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of Fr with $\phi = 0.6, Da = 0.1$, $n = 0.5$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $We = 0.02$.

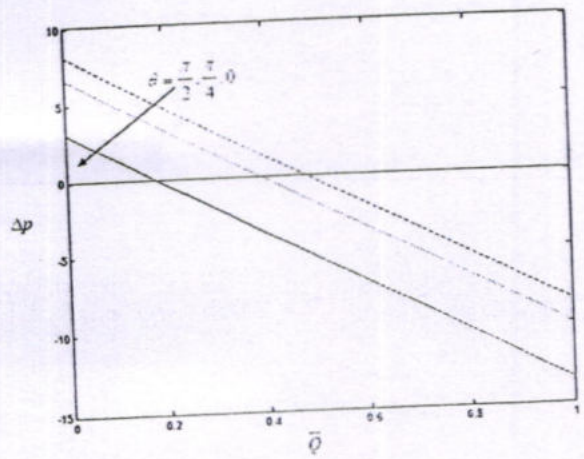

Fig. 7 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of θ with $\phi = 0.6, Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.02$.

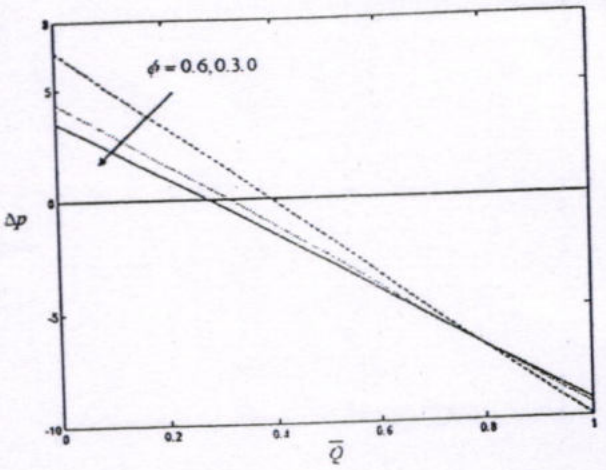

Fig. 8 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of ϕ with $We = 0.02$, $n = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $Da = 0.1$.

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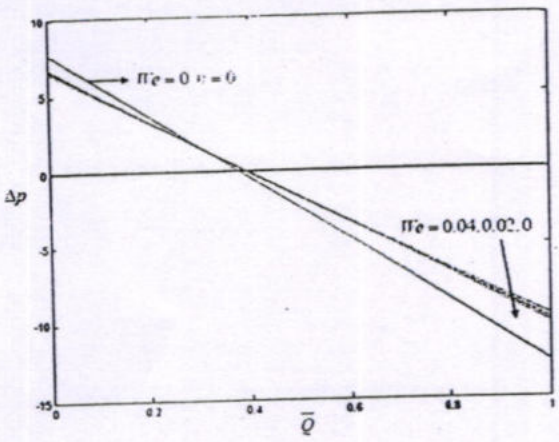

Fig. 2 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of We with $\phi = 0.5$, $n = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $Da = 0.1$.

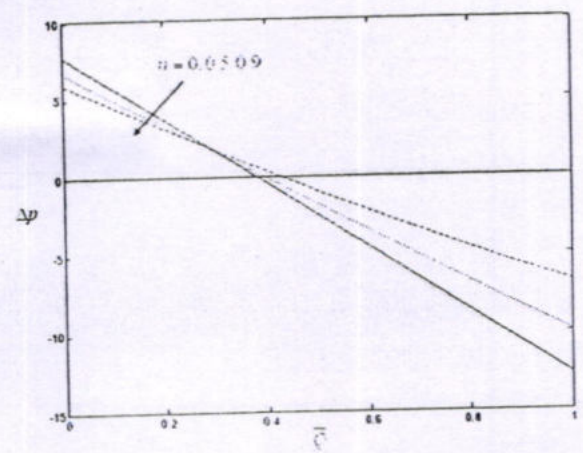

Fig. 3 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of n with $\phi = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$, $We = 0.02$ and $Da = 0.1$.

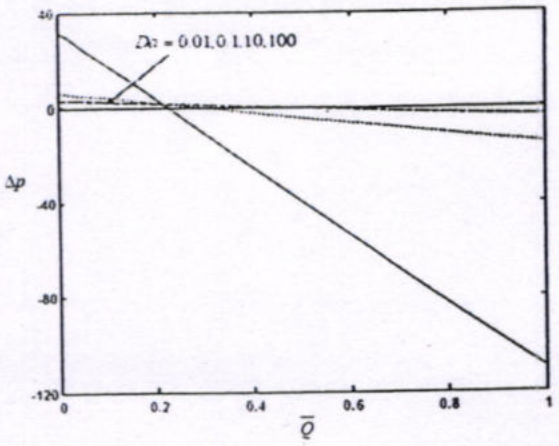

Fig. 4 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of Da with $\phi = 0.5$, $n = 0.5$, $Fr = 0.2$, $\mathrm{Re} = 1$, $\theta = \frac{\pi}{4}$ and $We = 0.02$.

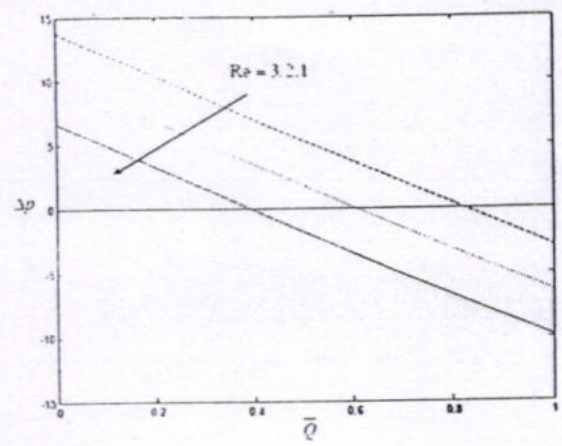

Fig. 5 The variation of pressure rise Δp with time-averaged volume flow rate $\overline{Q}$ for different values of Re with $\phi = 0.6$, $Da = 0.1$, $n = 0.5$, $Fr = 0.2$, $\theta = \frac{\pi}{4}$ and $We = 0.01$.

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10

Extraction of diabetic and eye diseases from the retinal images using image processing algorithms.

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ABSTRACT:-

diabetics can inspire other illnesses in the body of patients. One such illness is related to the retina of human eyes that affects the retinal and retina construction in different ways. The screening for detection of such abnormalities in retina is called Diabetic Retinopathy (DR).

Latest technological advances in the image processing helps auto detection of diabetic retinopathy based on the study of feature extractions. In our proposed system we use four algorithms for extracting the feature extraction. The initial step is to capture the input retinal image using digital fundus camera. The next step is the pre-processing stage, we use improved median filter to remove the unwanted distortions or noises present in the image.

Upcoming is the feature extractions process that is carried out on the pre-processed retinal image. The four extractions are blood vessels, exudates, micro aneurysms, and optic disc. The algorithms used are kirsch edge detection, fuzzy clustering, morphological distance based algorithm and watershed algorithm respectively. Here the fours features are nothing but the main diseases in eye.

Based on the output results of these four extractions we find the severity of the disease as mild, moderate or severely affected. And finally compared the above results with their blood sample results. Based on this comparison we will come to know our proposed algorithms are giving best results.

Key words: Improved median filter, kirsch Operator, blood vessel extraction, exudates, micro aneurysms, fuzzy clustering, morphological distance based algorithm, Optic discs, watershed algorithm, and diabetic and eye diseases detection.

I. INTRODUCTION:

Diabetes Retinopathyis a micro-vascular complication of diabetes, causing abnormalities in the retina.Sicknessin retina resulted from special diseases areidentify by special images from retina, which are obtained by using optic imaging called fundus. The World Health Organization (WHO) has calculated the number of persons with diabetes in the world would increase enormously: from 135 million in 1995 to 300 million in 2025[6]. In order to reduce the bad sound effects associated with the processing input image was pre-processed by a filter, then, the retinal fundus image is classified in to three primary components such as Red Channel (R), Green Channel (G) and Blue Channel (B)[7]. The green channel is high reactive to the blood vessels. The improved

median filter[1] is used to remove salt and pepper sound from the wicked image. Hence the output is the increased image An edge is an sudden change in the brightness (gray scale level) of the pixels.

The removal of blood vessels in retinal images is important step in diagnosis and medical care of diabetic retina. For diseased persons the diameter of the blood vessels may differ or otherwise there is a possibility for growth of new vessels when related with normal person's blood vessels.[8] The blood vessels get swallowed for diabetic patients and it gets narrower for glaucoma diseased patients. Exudates are one of the primary signs of diabetic retina , Automatic ooze out detection would be helpful for diabetic retinopathy screening process. Together color and sharp edge features to discover the exudates. The yellowish objects are detected first; the objects in the image with very sharp edges are then found using Kirsch's mask and other rotations of it on the green component. The combination of outcome of yellowish objects with very sharp fringe is used to determine the exudates. The Fuzzy C-Means (FCM) congregating is a well-known clustering technique for image partition, Many techniques have been performed for exudates observation, but they have defect. Poor quality images affect the separation result of bright and dark injury using thresholding and exudates feature extraction. Microaneursyms are the first clinical abnormality to be noticed in the eye for diabetic retinopathy they are red lesions. Red lesions are the first clinically observable injury indicating diabetic retinopathy. Therefore, their detection is vital for a prescreening system[13]. The optic disk is the shining part in the normal image that can be seen as light-colored, round or vertically Optical disc is the region where blood vessels and optic axon enter to the retina of human eyes. It is the shining part of the normal fundus images. Observation of the optic disc (OD) is considered as one of the vitalpart of analysis of digital colour retinal images [19],and in our proposed System watershed algorithm is used for the optic discs detection and hence the severity of the diabetes is examined. Based on the output results of these four extractions we find the severity of the disease as mild, moderate or severely affected. And finally compared the above results with their blood sample results. Based on this comparison we will come to know our proposed algorithms are giving best results.

II.MATERIALS AND METHODS:

All the images used in this paper are aquire from the government hospital real time patients. There are 110 retinal colour fundus images with an range size of 400 × 600 x 3 pixels, along with the optic nerve contours traced by two experts.

III. PROPOSED SYSTEM

The proposed system consists of four stages. First stage is collecting the images of patients by fundus camera. This will be raw images and contains full of noise. This noise will be detected using filters. Second stage is pre-processing .Where improved median sift is used for the removal of error caused while taking of the image and to reduce the noise and third stage which is the extraction of features of eye like blood vessel, Exudates, microaneursyms and optic discs using image processing algorithms. They are kirsch edge detection algorithm, fuzzy clustering algorithm, morphological distance based algorithm and watershed algorithm respectively and finally fourth stage is comparison between blood sample

results and simulation results. The proposed system for detection of eye disease and diabetes is illustrated in Fig. 1.

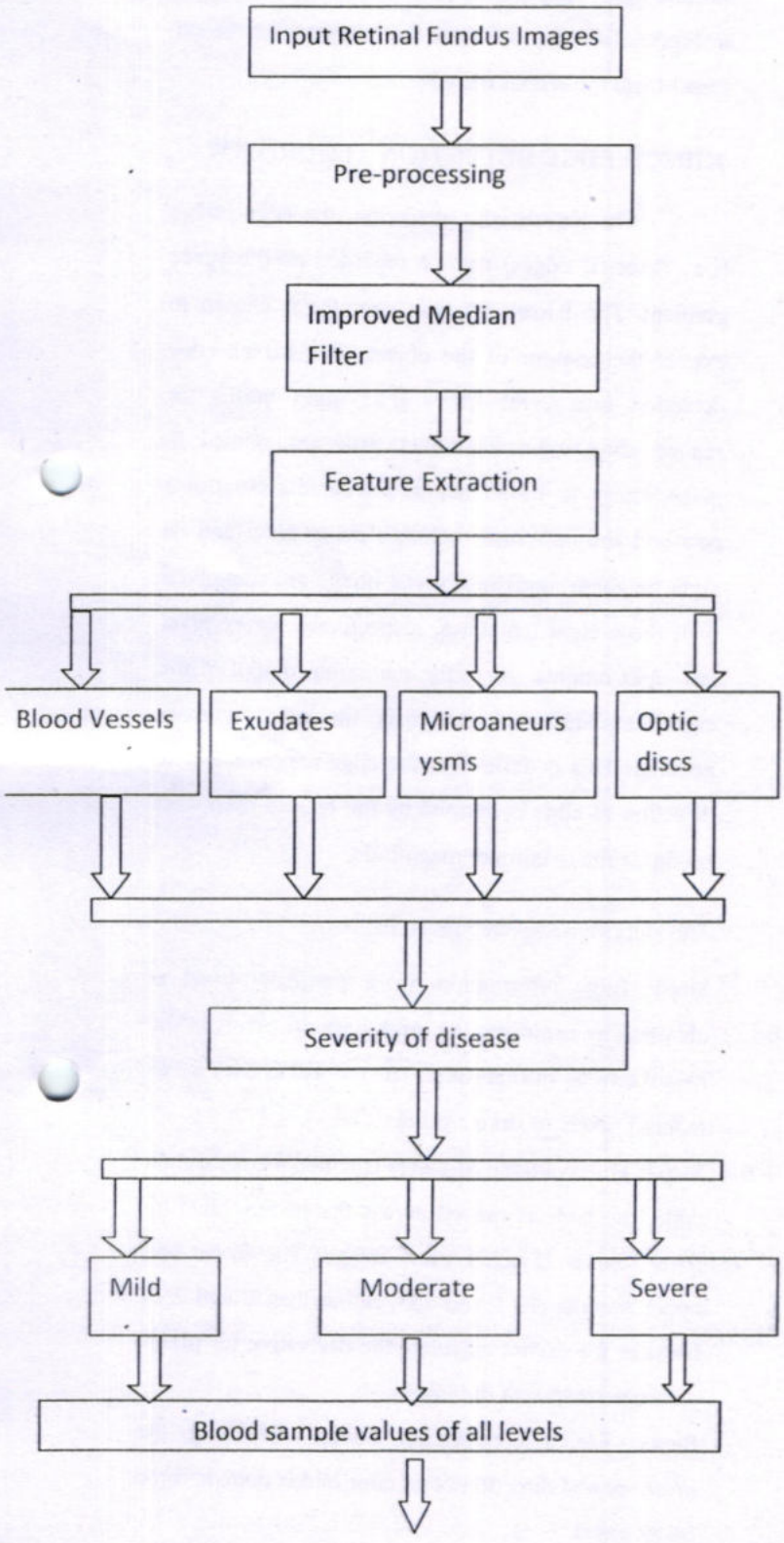


Fig. 1 Proposed System for diabetic and eye diseases detection.

I-STAGE:-Collecting real time patients images from the hospitals. These images are taken by fundus camera. This will be full of noise and raw images. That noise can be reduced in the second stage using filters.

II-STAGE: PREPROCESSING

The pre-processing step removes difference due to image gain, such as inhomogeneous illumination. Techniques such as morphological operations are try to the input image. The following sessions complex the improved median filters are used in pre-processing stage in this paper.

IMPROVED MEDIAN FILTER

To remove salt and pepper noise from the corrupted image with more algorithms is used. The output of all the filters are compared with improved median filter for the given input retinal images and also compared the performance of image with signal to nose ratio also finally we concluded that our proposed filter i.e improved median filter is giving best results compared to other filters. The algorithm is given below.

Step 1: A two dimensional opening (denoted by 3×3 W) of size 3x3 is selected and focus around the processed pixel in the raw image.

Step 2: Sort the pixels in the selected opening according to the ascending order and find the median pixel value given by Pmed), maximum pixel value (Pmax) and minimum pixel value (Pmin) of the class vector V0. Now the first and last components of the vector V is the Pmin and Pmax respectively and the central elements of the vector is the Pmed.

Step 3: If the processed pixel is within the scope Pmin< P(x, y) <Pmax, Pmin> 0 and Pmax< 255,it is group as uncorrupted pixel and it is left unchanged. or p(x, y) is classified as wrong pixel.

Step 4: If p(x, y) is wrong pixel, then we have the following two cases:

Case 1: If Pmin<Pmed<Pmax and 0 <Pmed< 255, change the wrong pixel p(x, y) with Pmed

Case 2: If the state in case 1 is not satisfied then Pmed is a true pixel. In this case calculate the difference between each pair of adjacent pixel across the class V_0 and obtain the difference vector V_D .Then find the maximum difference in the V_D and dot its corresponding pixel in the V_0 to the action pixel.

Step 5: Step 1 to step 4 are repeated until the action is completed for the completed image.

III-STAGE-FEATURE EXTRACTION

FIRST FEATURE OR DISEASE: BLOOD VESSELS FEATURE EXTRACTION:

The observation of blood vessels from the retinal images is a tedious process. Kirsch algorithm is used to detect the blood vessels effectively has been proposed. Accurate detection of blood vessels from retina is an main job in computer aided identification of Diabetic Retinopathy. Since the blood vessels are distributed in different directions, morphology processing with multidirectional arranges elements are used to remove the blood vessel from the retinal images.

KIRSCH EDGE DETECTION ALGORITHM

For Kirsch edge detection, the edge image (i.e., detected edges) can be regarded as the space gradient. The Kirsch gradient operator is chosen to extract the contour of the object, The Kirsch edge detection uses eight filters (i.e., eight masks for related eight main directions) that are applied to given image to detect edges. Except the outermost row and the outermost column, every pixel and its eight neighborhoods in a given image are convolved with these eight templates, respectively. Every pixel has eight outputs. Also, the maximum output of the eight templates is chosen to be the value in given position. This is defined as the edge magnitude. The direction of edge is defined by the related mask that produces the maximum magnitude.

The algorithm steps are given below

Step1. Edge information for a particular pixel is obtained by exploring the brightness of pixels in the neighborhood of that pixel, The algorithm uses a 3x3 table of pixels to store a pixel value.

Step2. The 3x3 table of pixels is called a convolution table, the table is moved across the image, pixel by pixel. For a 256x256 pixel image .The lower and upper bounds are 1 and 254, rather than 0 and 255, because we cannot calculate the derivative for pixels on the perimeter of the image.

Step3. For a convolution table, calculating the presence and direction of an edge and is done in three major cases:

Case1. Calculate the derivative for each of the eight directions are north, northeast, east, southeast, south,

southwest, west, and northwest. Now make the matrix 3 by 3 and assume that 1st row elements are (0,0),(0.1),(0,2). Same for next two rows also.

- DerivNE=5x(table[0;1]+table[0;2]+table[1;2])3x(table[0;0]+table[1;0]+table[2;0]+table[2;1]+table[2;2])
- DerivSW=5x(table[2;1]+table[2;0]+table[1;0])3x(table[2;2]+table[1;2]+table[0;2]+table[0;1]+table[0;0])
- DerivN=5x(table[0;0]+table[0;1]+table[0;2])3x(table[1;0]+table[2;0]+table[2;1]+table[2;2]+table[1;2])

Same manner for other directions

Case2. Find the value and direction of the maximum derivative EdgeMax = Maximum of absolute values of eight derivative DirMax = Direction of EdgeMax

(a) Deriv W (b) Deriv N (c) Deriv N (d) Deriv NE (e) Deriv E (f) Deriv SE (g) Deriv S (h) Deriv SW

This means that if, for instance, Deriv N and Deriv E are equal, Deriv N must be Picked

Case3. Check if the maximum derivative is above the threshold.

ifEdgeMax> 400 then
Edge = true
Dir = DirMax
else
Edge = false
Dir = 000

Step4. Step 1 to step 3 are repeated until the processing is completed for the entire image .This feature extraction is compared with all the algorithms .finally our proposed algorithm given correct results.

SECOND FEATURE OR DISEASE EXTRACTION ALGORITHM:

EXUDATES FEATURE EXTRACTION:

Exudates are Small yellow white patches with sharp margins and different shapes. Exudates are one of the early occurring lesions. Exudates are accumulations of lipid and protein in the retina. Typically they are bright, reflective, white or cream colored lesions. They indicate increased vessel permeability and a connected risk of retinal edema. They are a marker of fluid accumulation in the retina. When they present close to the macula center they form sight threatening lesions. Fuzzy clustering is more natural than hard clustering. It is used to highlight salient regions, extracts relevant features and finally classifies those regions.

FUZZY CLUSTERING ALGORITHM:

Fuzzy clustering is an overlapping clustering algorithm, where each point may belong to two or more clusters with different degrees of membership. The features with close similarity in an image are grouped into the same cluster. The similarity is defined by the distance of the features vector to the cluster centers. Euclidean distance is used to measure this distance and data will be associated to an appropriate membership value. The cluster center is updated until the difference between adjacent objective function, as displayed in Equation 1 is close to zero or practically less than a predefined small constant.

$$J_m = \sum_{i=1}^{M} \sum_{j=1}^{C} u_{ij}^{m} \| x_i - c_j \|_2 \qquad (1)$$

where m is an exponential weighting function that controls the fuzziness of the membership function, it is set to 2 ,M is number of features. C is number of clusters. uij is the degree of membership of xi in the cluster j, xi is the ith of d-dimensional measured data, cj is the d-dimension center of the cluster, and ||*|| is any norm expressing the similarity between any measured feature and the center.

Fuzzy partitioning is carried out through an iterative optimization of the objective function shown above, with the update of membership uij and the cluster centerscj by equation 2 and 3:

$$u_{ij} = 1 \Big/ \sum_{k=1}^{c} \left(\| x_i - c_j \| \, \| x_i - c_k \| \right)^{\frac{2}{m-1}} \quad (2)$$

$$c_j = \sum_{i=1}^{M} u_{ij}^{m} x_i \Big/ \sum_{i=1}^{M} u_{ij}^{m} \quad (3)$$

The iteration will stop when Equation 4 is satisfied:

$$\max_{ij} \left\{ \left| u_{(k+1)ij} - u_{(k)ij} \right| \right\} < \varepsilon \quad (4)$$

where ε is a termination criterion, 0.00001 for our case. k is the iteration number, it is set to maximum of 200 for our case. This procedure converges to a local minimum or a saddle point of J_m.

The input to the algorithm is a set of features. The algorithm is composed of the following steps:

Step 1: Initialize the fuzzy partition matrix $U = [u_{ij}]$ ($U^{(0)}$) by generating random numbers in the range 0 to 1 subject to Equation 5:

$$\sum_{i=1}^{M} \sum_{j=1}^{C} u_{ij} = 1 \quad (5)$$

Step 2: At k-step: calculate the centers vectors $C^{(K)}=[c_j]$ with $U^{(K)}$ according to Equation 3 .

Step 3: Update the fuzzy partition matrix $U^{(K)}$, $U^{(K+1)}$ by the new computed u_{ij} according to Equation 2.

Step 4: Compute the objective operation according to Equation 1. If the difference betweenAdjacent values of the objective operation is less than termination criterion (ε) then stop the iteration; otherwise return to step 2.

The output from Fuzzy clustering is a list of cluster centers and n membership-grades for each pixel, where n is a number of desired clusters. A element will be assigned to the cluster with highest membership-grade.

THIRD FEATURE OR DISEASE EXTRACTION ALGORITHM:

MICROANERUSYMS FEATURE EXTRACTION:

The presence of microaneurysms is considered as early stage of diabetic retinopathy. Microaneurysms on the retina appear as small red dots of maximum size to be less than the diameter of the major optic veins. The recognition of microaneurysms is essential in the operation of diabetic retinopathy grading, since it forms the basis of deciding whether an picture of a patient's eye should be considered healthy or not. A key feature to recognize the Diabetic retinopathy is to observe microaneurysms (MAs) in the fundus of the eye.

MORPHOLOGICAL DISTANCE BASED ALGORITHM:

Microaneurysms are small saccular pocket caused by local distension of capillary walls and appear as small red dots. Their walls are thin and rupture easily to cause haemorrhages.to detect visible micro aneurysms in retina using size and shapeautomated micro aneurysms detection and diabetic retinopathy grading and hough transforms are present but the morphological distance based algorithm for microaneursyms is effective and the steps involved as shown below.

Step 1: The preprocessing step filters the image, increases the contrast and performs a shading correction in order to balance the non-uniform

illumination across the picture. The diameter-closing step is a mathematical morphological transformation that fills in all the black dots with diameters smaller than λ.

Step 2: After performing such closing transformation, the grey-scale value of the filled-in dots is higher than in the increased preprocessed image, while the vessels and other elements remain virtually unaffected. The black top-hat step uses size and shape criteria to isolate the black components contrasted against the background.

step 3: The black hat transform is the result of the difference between the images obtained by the sizeclosing and pre processing steps. The automated threshold step identifies all elements in the black top-hat picture that are possible μA candidates. Step 4: Finally a K-nearest neighbours (k -NN) classifier is used for classification. It uses the Properties calculated for the candidates to find them as either true μA or false positives based on the learning set in the small database. The classifier acts like a human grader by taking into account factors such as size, contrast, circularity, grey-scale level and colour.Then the true microaneurysms are detected.

FOURTH FEATURE OR DISEASE EXTRACTION ALGORITHM:

OPTIC DISC EXTRACTION:

The optic disk is the brightest part in the retina, The image is filtered in order to eliminate large gray level difference within the papillary region. The vessels are filled applying a simple Closing operation. Classical Watershed transformation is register to the gradient to observe contours of the optic disc. The image is filtered in order to eliminate large gray level difference within the papillary region. The vessels are filled applying a simple Closing operation. Pure Watershed transformation is applied to the gradient to detect contours of the optic discs.

WATERSHED TRANSFORMATION (VINCENT SOILLE ALGORITHM):

An application of the watershed transform of Denition 3.2 was presented by Vincent &Soille. Since we want to discuss this application in some detail, we reproduce their algorithm here. In this algorithm there are two steps:

Step 1: sorting the pixels w.r.t. increasing grey value, for direct access to pixels at a certain grey level.

Step 2: A flooding step, proceeding level by level and starting from the minima. The implementation uses a fifo queue of elements, that is, a _rst-in-_rst-out data structure on which the following operations can be performed: _foadd(p; queue) adds pixel p at the end of the queue, _fo remove(queue) returns and removes the _rst element of the queue,foinit(queue) initializes an empty queue, and _fo empty(queue) is a test which returns true if the queue is clear and false otherwise.

The algorithm assigns a clear label to each minimum and its associated basin by iteratively flooding the graph using a breadth-_rst algorithm as follows:

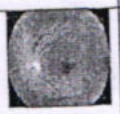
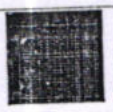
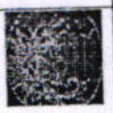
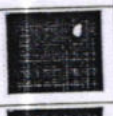
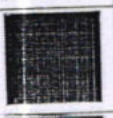
Step 3: In the flooding step, all nodes with grey level h are _rst given the label mask. Then those nodes which have labeled neighbours from the previous iteration are inserted in the queue, and from these elements geodesic inuence zones are propagated inside the set of masked pixels. If a element is

adjacent to two or more different basins, it is marked as a watershed node by the label wshed. If the element can only be reached from nodes which have the same label, the node is merged with the corresponding basin. elements which at the end still have the value mask belong to a set of new minima at level h,whose connected components get a new label.

IV-STAGE-COMPARISON:

Based on the output results of these four extractions we find the severity of the disease as mild, moderate or severely affected. And finally compared the above results with their blood sample results. Based on this comparison we will come to know our proposed algorithms are giving best results.

IV. SIMULATION AND RESULT

S No	Patient name	Patient I/P image	Eye diseases				Disease severity	Blood sample value(mg /dl)	Comparison
			Blood vessels	Exudates	microaneaerysms	Optic disk			
1	Marry						Mild	130	Satisfied
2	VenkateswaraRao						Moderate	180	Satisfied
3	Venkataswaralu						Normal	90	Satisfied
4	NagarajuKishore						Sever	200	Satisfied

We implemented our proposed method using matlab .The improved median filter is implemented for denoising of highly corrupted images and edge prevention. The kirsch edge detection algorithm works well for the images having clear distinguish between the foreground and background, since the retinal blood container can be considered as required foreground information for fundus images kirsch algorithm can be effectively register. The exudates. Exudates are one of the most important and primary factor of diabetic retinopathy and are responsible for hazy views and blindness fuzzy clustering algorithms is used for the extraction of exudates after this microaneursyms are first clinical abnormality to be noticed in eye. The red lesion is detected by the morphological distance based algorithms.The bright portion of the fundus image is optic discs which is a pale, round or verticallyslightly oval shape disk circular region

from where the blood vessels emanate is called the optic disk.

From all the images we can say that improved median filter, the kirsch's operator, fuzzy clustering algorithms, morphological distance based algorithm and watershed algorithm gives the better results than any other algorithm for the blood vessels extraction, Exudates and microaneursyms Extraction.

Based on the output results of these four extractions we find the severity of the disease as mild, moderate or severely affected. And finally compared the above results with their blood sample results. Based on this comparison we will come to know our proposed algorithms are giving best results.

V. CONCLUSION.

Retinal images play vital role in several applications such as disease diagnosis and human identification. The segmented blood vessels can be used for diagnosis of diseases like diabetic, glaucoma and blind dot. In our proposed method the retinal image as the input to the improved median filter is applied for preprocessing. The stimulation result shows that the improved median filter algorithm can do well with relationship between the effects of noise reduction and time complexity of algorithm, the kirsch edge detection algorithm can set and reset the threshold to obtain the most suitable edge of the image for the retaining the image details better. Fuzzy clustering is more natural and used to highlight salientregions, extracts relevant features ie, Exudates which are the Smallyellowwhitepatcheswithsharpmargins anddifferent shapes which will not only detects the diabetes but also the early stage of the diabetes ie, non-poliferative diabetic retinopathy,microaneursyms may appear in isolation or in clusters as tiny, dark red dots or looking like tiny haemorrhages within the light sensitive retina and are detected by the morphological distance based algorithm. The bright circular region from where the blood vessels emanate is called the optic disk. Feature the exact geometric round shape of the optic is gone irregular due to diabetes which is detected by the watershed algorithm to determine the stage of the diabetes. The simulation results show that the studied method can be applied to different types of image and provide very satisfying results .The conclusions of both segmentation and enhancement steps show that our method effectively detects the thin blood vessels, Exudates, microaneursyms and optic discs for the stage of diabetes.And finally compared the above results with their blood sample results. Based on this comparison we will come to know our proposed algorithms are giving best results.

FUTURE ENHANCEMENT

This work determines the presence of Non proliferative diabetic retinopathy in a patient by trying techniques of digital image processing on fundus images taken by the use of medical iinage camera by a medical personnel in the hospital . In this work , we have investigated and proposed a computer based system to identify normal , Non-proliferative diabetic retinopathy. the kirsch's operator will detect the blood vessels but the output vessels detected is having more width than the original blood vessels so enhancement is required in this operator and the extraction of exudates by the use of fuzzy clustering method only the mild and moderate stage of the diabetes can be known and the third stage cannot be determine. After the microaneursyms detection by the morphological distance based algorithm the third stage is

determined.The most difficult problem of optic disc extraction is to locate the region of interest. Since the location of optical disc is considered as the landmark for the analysis and identification of eye disease and blood vessels in retinal images Even though by now some progress has been achieved there are still remaining challenges and directions for further research, such as removing different features and developing better classification algorithms and integration of classifiers to give better performance and reduce the classification errors.

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DESIGN AND ANALYSIS OF PRE COMPRESSING OF AIR IN A SINGLE CYLINDER FOUR STROKE ENGINE AT BDC

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Abstract- **In IC engines the combustion efficiency is based upon the quality and quantity of air fuel mixture for better flame propagation. There are many ways to improve the combustion characteristics of an engine such as, rich air-fuel mixture, providing turbulence to the air fuel mixture and also by increasing the quantity of air in air-fuel mixture ratio. Now a day's turbo chargers and super chargers are used to increase the amount of air in air-fuel mixture ratio. In the present the quantity of air in air-fuel mixture is increased by using the downward stroke of the piston. While piston is coming to BDC air is being introduced. At BDC there will be an obstacle to restrict the air flow therefore the air gets stuck in between piston and the obstacle. As the piston moves, it forces the air to compress. Later the compressed air is guided to intake manifold to initiate the combustion process. For achieving the above mentioned factors some modifications need to be done to the engine components such as modifying piston, cylinder block and connecting rod. By doing this the combustion characteristics can be improved and also no need of any other additional components to compress the air. The modelling of existed and modified engine is being done in commercial designing software (Solid Works) and analysis will be carried out using CFD software (Star CCM+) at 3 different velocities i.e.., 10m/sec, 12.5m/sec and 15 m/sec respectively using k-ε model, k-ω models.**

Index terms: **Combustion, Air- Fuel mixture, Turbulence, BDC, CFD**

I. INTRODUCTION

In order to increase the power of an engine there has to be an increase in pressure, and hence force exerted on the piston, during the power stroke. The amount of work that the power stroke delivers is basically determined by the air-fuel mixture in the combustion chamber. The combustion that occurs during the end of the compression stroke and throughout the power stroke is determined by how much air is mixed with the fuel. When air is compressed its density increases but volume decreases [1] [2]. Hence compressing air at the beginning of an engine cycle increases the power output by increasing the amount of air that is mixed with fuel. Since the total volume of occupied space within the cylinder is decreased when compressing air, more air can be used to combust with the fuel. This is exactly what superchargers and turbochargers do. They increase the pressure to increase the density of the air to make the engine increase in power [3].

In this paper. the downward stroke of piston to compress the air has been utilized by some modifications to engine [6]. When the piston moves upward, air from surroundings enter into the cylinder through inlet value at BDC just like suction stroke in regular combustion cycle. While piston moves downward, it starts to compress the air inside the cylinder till it reaches the certain pressure. As the air gets compressed the air is taken out from cylinder to the intake manifold. This is simulated using CFD with proper boundary conditions [5].

The most common super-charger is a mechanical supercharger. The compressor is driven using power from the engine. In a turbocharger, a combination of a compressor and turbine are used. Although this requires the use of another shaft, the engine power is not used to provide the work needed to run the compressor. The exhaust gases go into the turbine, which uses the energy content in the hot gases to run the shaft that runs the compressor [4].

II. GEOMETRY DEVELOPMENT AND MESHING OF COMPUTATIONAL DOMAIN

The existed engine has been modified by placing a plate at BDC in between cylinder and crank case, the piston bottom is also closed and a piston rod is added in between piston and

connecting rod. Inlet and outlet values are provided at the BDC position of the cylinder to let air in and out. The piston is connected to connecting rod by means of piston rod. Engine is modelled using solidworks and it been meshed in Star ccm+ software using trimmer type of meshing. For reference to designing the engine kirloskar engine is selected with specifications as shown in table 1. The modifications which are done to the kiloskar engine as per the study are shown in table 2.

Table 1: specifications of Engine.

S.No	Engine specifications	
1.	BHP	5hp @3600
2.	Cooling	Air cooled
3.	Number of cylinders	One
4.	Bore	78
5.	Stroke	68
6.	Compression ratio	18:1
7.	rpm	3600

Table 2: Modification of Engine.

S. No	Modifications made	Dimensions (mm)
1	Diameter of Piston rod	30
2	Diameter of Inlet value for air	15
3	Diameter of Outlet valve for air	20
4	Cylinder length	156

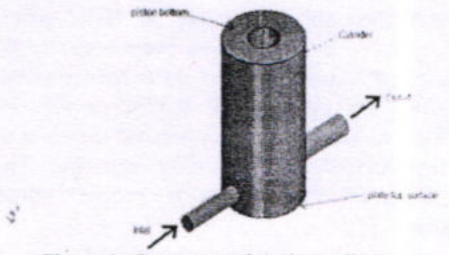

Figure 1- Geometry of engine cylinder

Figure 2- Mesh structure of engine cylinder

III. RESULTS AND DISCUSSIONS

A. *Simulation and calculation*

Fluid region inside the cylinder is taken for analysing the pressure to which the air is compressing. The simulation is carried out using all the turbulence models under k- ε model and k- ω model. In fluid region, upper part is consider as bottom of piston and assigned as wall, bottom part of fluid region is taken as upper part of plate and assigned as wall too even remaining parts also considered as walls except outlet and inlets sometimes considered as pressure outlets. The boundary conditions for simulations are as follows,

- Turbulence model – k- ε model, k- ω model
- Air as medium
- Properties of air- Same as Atmospheric air

Simulation is carried out in 3 Phases, in phase 1 when piston moves downward air gets pressurized till it reaches 4bar and simulation gets stopped by assigning stopping criteria as pressure reaches 4bar. In phase 2 outlet valve is opened and air sent out completely with half rotation of crank and simulation gets stopped as the solution time reaches 0.0125 secs given as stopping criteria. In phase 3 inlet valve is set to open to suck air from surroundings due to suction created because of piston upward motion and simulation gets stops as it reaches suggested physical time.

a. *Simulation at 10m/sec of piston velocity*

Simulation is carried out at 2400 rpm of engine and physical time and time/ step is calculated as follows,

Time for 1 complete rotation of crank for 250mm translation of 250mm- 1/40

- 0.025sec

For half rotation of crank for 125mm piston translation - 0.025/2 – 0.0125 sec

Piston velocity – 125/0.0125 – 10000mm/sec

Time per step – 125mm/0.0125sec- 1.0 E-04

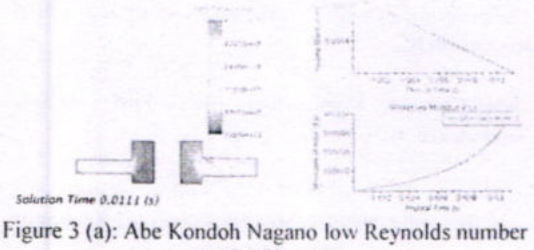

Figure 3 (a): Abe Kondoh Nagano low Reynolds number model Phase I

Figure 3 (b): Abe Kondoh Nagano low Reynolds number Phase II

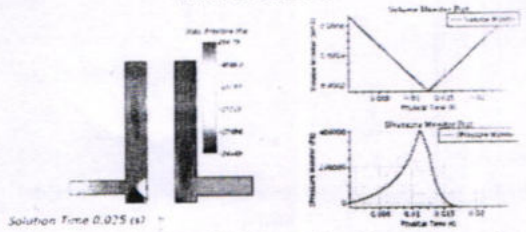

Figure 3 (c): Abe Kondoh Nagano low Reynolds number model Phase III

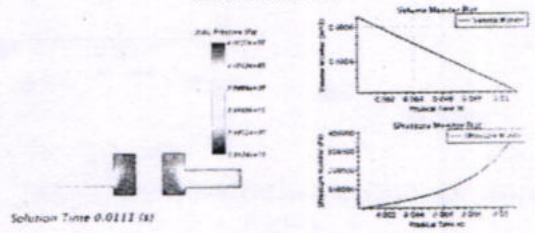

Figure 4 (a): Realizable k- ε model phase I

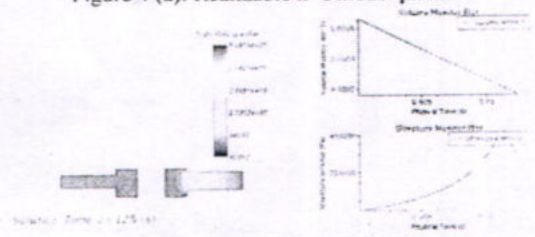

Figure 4 (b): Realizable k- ε model phase II

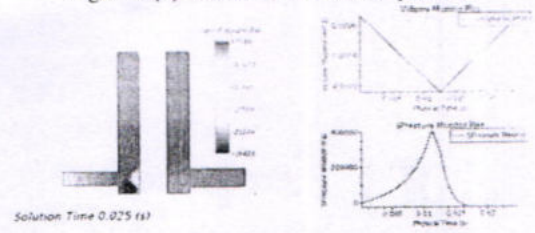

Figure 4 (c): Realizable k- ε model phase III

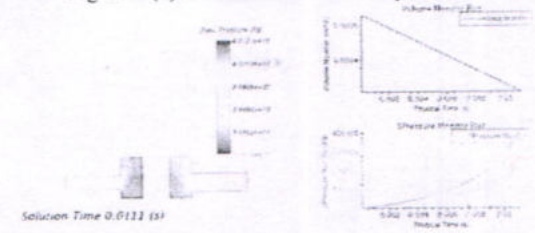

Figure 5 (a): Standard stress transport wilox k- ω model phase I

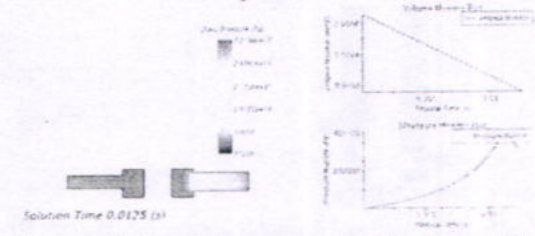

Figure 5 (b): Standard stress transport wilox k- ω model phase II

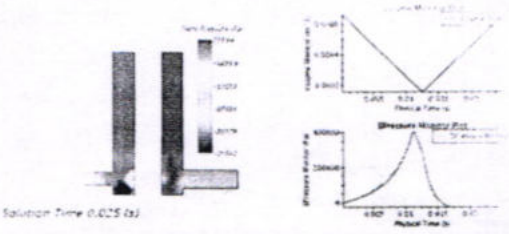

Figure 5 (c): Standard stress transport wilox k- ω model phase III

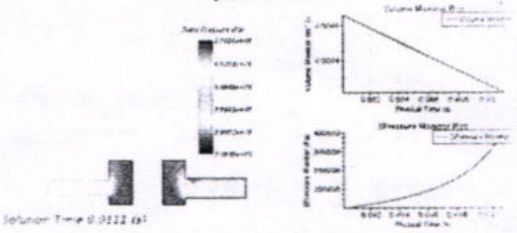

Figure 6(a): V2F low Reynolds number model phase I

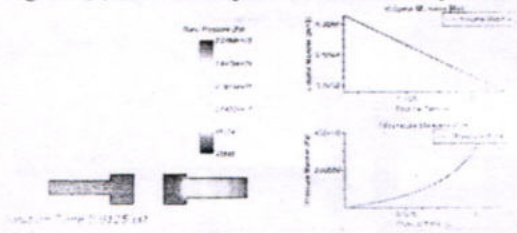

Figure 6(b): V2F low Reynolds number model phase II

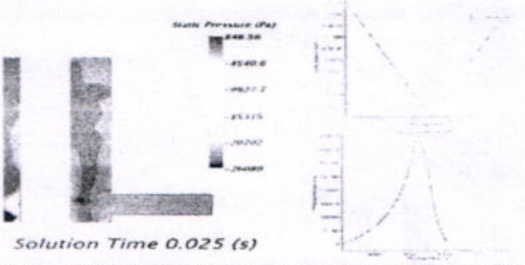

Figure 6(c): V2F low Reynolds number model phase III

b. Simulation at 12.5m/sec of piston velocity

Simulation is carried out at 3000 rpm of engine and physical time and time/ step is calculated as follows.

Time for 1 complete rotation of crank for 250mm translation of 250mm- 1/50

- 0.02sec

For half rotation of crank for 125mm piston translation - 0.02/2

- 0.01 sec

Piston velocity – 125/0.01 – 12500mm/sec

Time per step – 125mm/0.01sec- 8.0 E-05

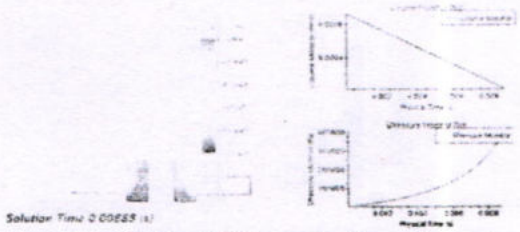

Figure 7(a): Abe Kondoh Nagano low Reynolds number model Phase I

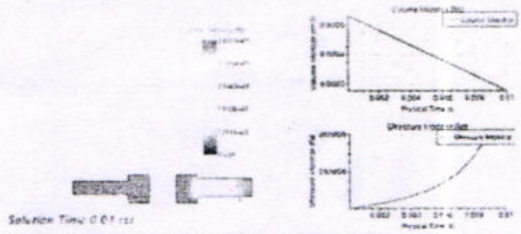

Figure 7(b): Abe Kondoh Nagano low Reynolds number model Phase II

Figure 7(c): Abe Kondoh Nagano low Reynolds number model Phase III

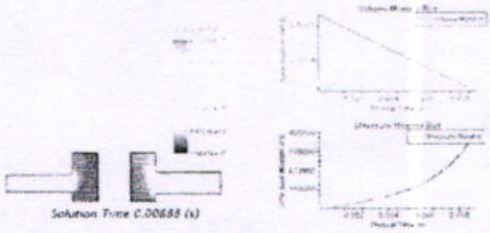

Figure 8(a): Realizable k- ε model phase I

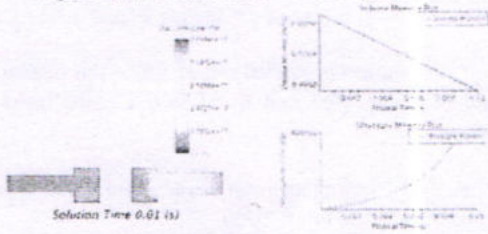

Figure 8(b): Realizable k- ε model phase II

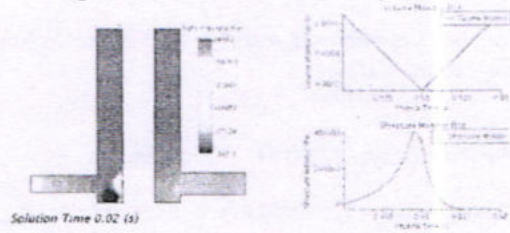

Figure 8(c): Realizable k- ε model phase III

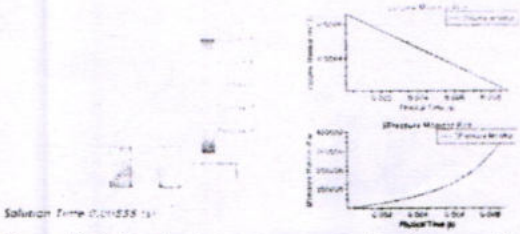

Figure 9(a): Standard stress transport wilox k- ω model phase I

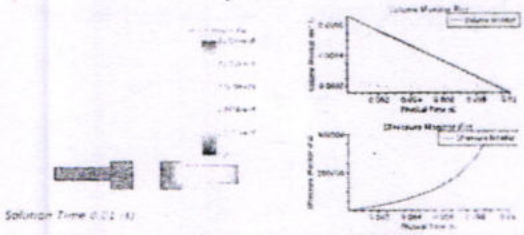

Figure 9(b): Standard stress transport wilox k- ω model phase II

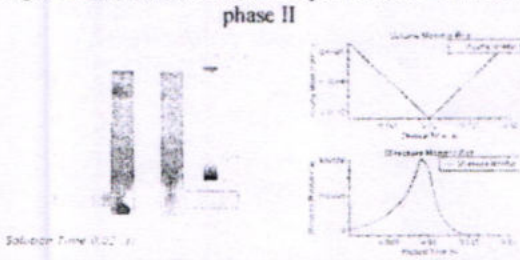

Figure 9(c): Standard stress transport wilox k- ω model phase III

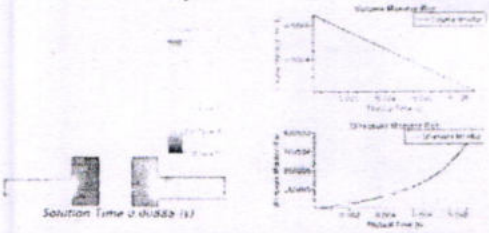

Figure 10(a): V2F low Reynolds number model phase I

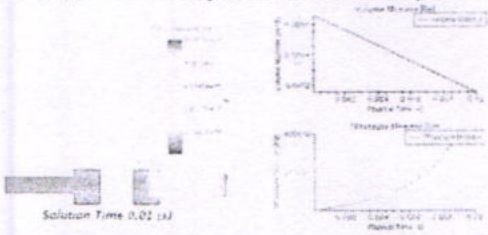

Figure 10(b): V2F low Reynolds number model phase II

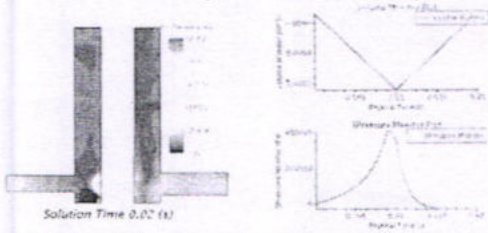

Figure 10(c): V2F low Reynolds number model phase III

c. Simulation at 10m sec of piston velocity

Simulation is carried out at 3600 rpm of engine and physical time and time/ step is calculated as follows,

Time for 1 complete rotation of crank for 250mm translation of 250mm- 1/60

- 0.01666sec

For half rotation of crank for 125mm piston translation - 0.025/2 – 0.008333 sec

Piston velocity – 125/0.008333 – 15000mm/sec

Time per step – 125mm/0.008333sec- 6.66667E-04

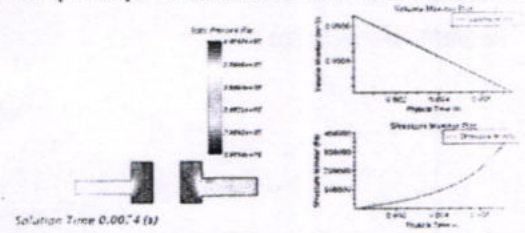

Figure 11(a): Abe Kondoh Nagano low Reynolds number model Phase I

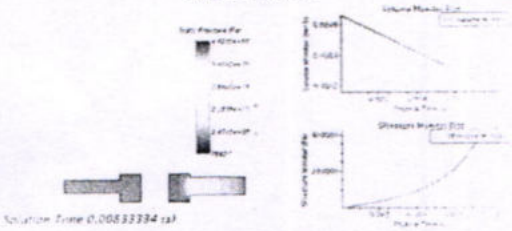

Figure 11(b): Abe Kondoh Nagano low Reynolds number model Phase II

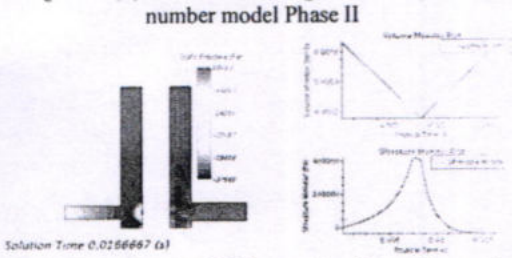

Figure 11(c): Abe Kondoh Nagano low Reynolds number model Phase III

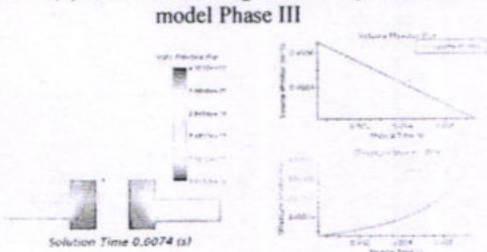

Figure 12(a): Realizable k- ε model phase I

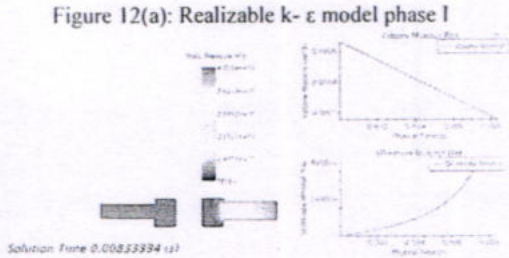

Figure 12(b): Realizable k- ε model phase II

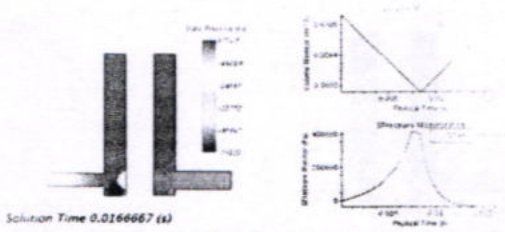

Figure 12(c): Realizable k- ε model phase III

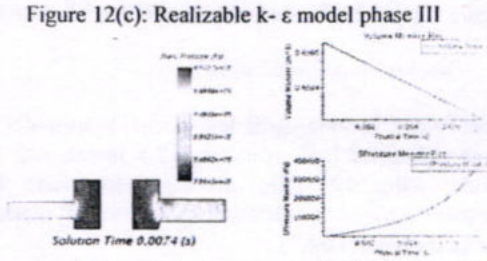

Figure 13(a): Standard stress transport wilox k- ω model phase I

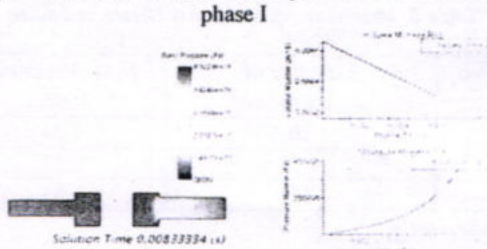

Figure 13(b): Standard stress transport wilox k- ω model phase II

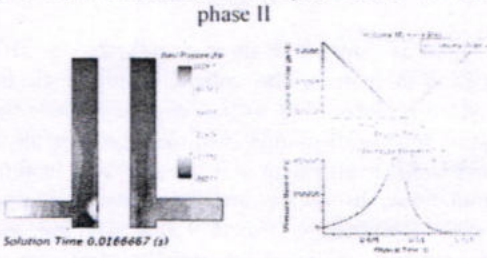

Figure 13(c): Standard stress transport wilox k- ω model phase III

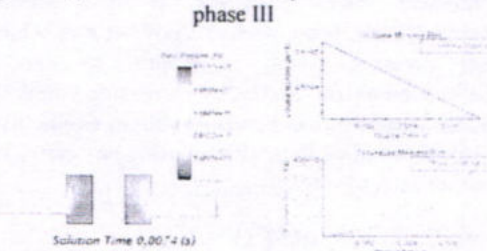

Figure 14(a): V2F low Reynolds number model phase I

Figure 14(b): V2F low Reynolds number model phase II

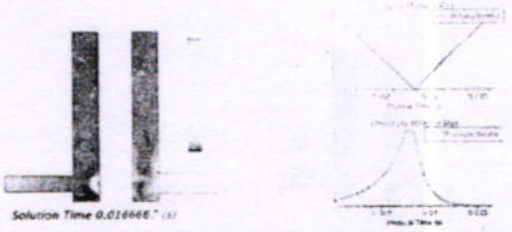

Figure 14(c): V2F low Reynolds number model phase III

B. Discussion of simulations

Simulations is done using k-ε model, k-ω model at three velocities i.e.., 10m/sec, 12.5 m/sec and 15 m/sec. After the doing all the simulations the pressure achieved at different speeds for all models are as shown in table 3,

Table 3: Maximum pressures at different velocities

S.No	Velocity of piston(m/sec)	Max. Pressure (bar)
1.	10	4.24
2.	12.5	4.37
3.	15	4.53

IV. CONCLUSION

In this paper the air is pressurized at BDC position to increase the volume of air in air fuel mixture by increasing its density. To achieve this, piston downward motion is utilized successfully to compress it to an extent of 4 bar pressure. In above simulations, using k-ε and k-ω models average pressure achieved is around 4.3bar. By following this method, devices like turbochargers can be eliminated, which compress air to a pressure around 3.2 bar, using present study we can achieve 4bar pressure which is helpful to improve combustion characteristics by increasing amount of air. In future this can be achievable in engine itself by some modifications without using any additional components.

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Computer Vision and Machine Vision Techniques for Assessing Quality of Food Products – A Review

Anusha G Rao, Dr.S.B. Kulkarni, B. Raghavendra Rao and Dr. Shadaksharappa

Abstract— *Identification of quality is one of the important factors for food processing industry to ensure the quality of the product. A non–destructive method was best suited for achieving this requirement. A computer vision system was developed for such applications. The objective of this work is to provide in depth survey on different methods or ways that are carried out for evaluating the quality of food products.*

Keywords— *Fruit Quality Assessment, Quality Evaluation, Computer Vision*

I. INTRODUCTION

COMPUTER Vision System is the process of applying a range of technologies and methods to provide imaging-based automatic inspection, process control and robot guidance in industrial applications. There are systems available for sorting of vegetables and fruits, locating the defects etc. Computer Vision replaces or imitates the visual human testing methods & are based on imaging technologies. Applications like grading the fruit by its quality, size or ripeness are based on its appearance. Fruits/vegetables can be classified based on external factors and internal factors. External factors include shape, size, texture, color and so on. Internal factors include physic-chemical properties.

Traditional non-destructive detection methods include optical properties, sonic vibration, machine vision technique, nuclear magnetic resonance and many more, for fruit quality. These had many advantages over traditional instrumental and chemical analysis methods. [2]

Computer vision is a novel technology for acquiring and analysing an image of a real scene by computers to control machines or to process it. It includes capturing, processing and analysing images to facilitate the objective and non-destructive assessment of visual quality characteristics in agricultural and food products.Machine vision traditionally refers to the use of computer vision in an industrial or practical application or process where it is necessary to execute a certain function or outcome based on the image analysis done by the vision system. The vision system uses software to identify pre-programmed features.In most of the quality inspection, the aim is to detect small defects or abnormalities in the object under inspection [3]. Classification is one of the main issues in evaluating the quality of fruits. In case of supervised classification, training set is required. Therefore some prior information should be given to the system which can be extracted from sample images. This process can affect time and accuracy as well.

II. LITERATURE SURVEY

The rapid development of science and technology and computer vision technique in the filed of food processing evolved many optimization technologies, which provide ample possibility in results, accuracy and effectiveness. These are soft computing techniques such as genetic algorithm, Artificial Neural Network, fuzzy logic and Support Vector machines. In agronomic and organic field, experts and scholars have developed methods of Artificial Neural Network, Support Vector machines and Fuzzy logic. But, fuzzy logic, artificial neuron network and genetic algorithms are the central techniques of soft computing. Fuzzy logic is best method to incorporates human thinking and supports decision –making. [1]

Soft Computing is the imprecise, approximation and inexact set of computing methods that can study, examine and evaluate complex problems [4].The complex problems which can't be solved by traditional methods and not so far able to provide profitable, worthwhile, systematic and comprehensive results. Soft computing techniques are capable of solving problems and provide solution in more efficient and profitable way.

The related work in the field and problem are discussed and outlined as follows:

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Apple

Color, texture and wavelet features are extracted from the apple images. Principal components analysis was applied on the extracted features and some preliminary performance tests were done with single and multi-layerperceptrons. [5].Kavdir et al. applied Fuzzy logic (FL)[6] as a decision making support to grade apples. Quality features such as the color, size and defects of apples were measured through different equipment.

Unay et al. introduced a computer vision based system to automatically sort apple fruits. Artificial neural network was used to segment the defected regions on fruit by pixel-wise processing. Linear Discriminant, nearest neighbor, fuzzy nearest neighbor, ada boost and support vector machines classifiers were tested for fruit grading [7].

Banana

Yizhong Wang [8] proposed a non-destructive method for fruits based on color identification. Color images RGB histograms were calculated which then were used as a quality parameter. Back Propagation (BP) neural network was established whose input was RGB histogram and quality is ensured by its output.

Dates

An automatic classification of date fruit is performed based on computer vision and pattern recognition.The method was implementedby experience on an image data spanning sevendifferent categories of dates. A mixture of fifteen different visualfeatures wasdrawn out, and then, multiple methods ofclassification were tried out, until satisfactory performance was achieved [9].

Table 1 shows the various methods and the accuracy for different fruits.

Table 1: Comparative Analysis of Different Methods for Fruit Quality evaluation

Fruit	Features	Methods Used	Accuracy
Apple	Color, Texture and wavelet	MLP-NN, [Quality Classification], Single Layer Perceptron	89.9%
		Multi-Layer Perceptron	83.7%
		Multi-Class Kernel SVM [kSVM], Max-Wins-Voting, Split & Merge Algorithm, PCA	88.2%
	Size [Major length, Minor Length, area]	FIS	96.25%
	Shape Analysis & Recognition [Major length, Minor Length, area, Perimeter]	Bwboundaries SVM	90%
		ADA Boost	90%
		Statistical & Syntactical	93.5%
		ANFC-LH	95-98%
	Color, size	Fuzzy Logic	89%
Banana	Ripeness	NN [Error Back Propagation Model]	96%
	Color Recognition	BP-NN	Not Defined
	Shape Analysis & Recognition, [Major length, Minor Length, area, Perimeter]	Bwboundaries, SVM	Not Defined
	Size [Major length, Minor Length, area]	FIS	81.25%
	Length, Width & Area	FIS Using DSP TMS 320 C6 713	Not Satisfactory
	Shape Analysis & Recognition [Major length, Minor Length, area, Perimeter]	Bwboundaries, SVM	Not Defined
Mangoes	Size [Major length, Minor Length, area]	FIS	98.75%
	Maturity Level	GMM	Not Satisfactory for defected samples
	Grading	Digital Fuzzy Image Processing, Content Predicted Analysis, Statistical Analysis	80%
	Sorting & Grading	GMM, Graph Cortour Tracking based on Chain Code	-
		SVM	97%
		LS- SVM [FD Values]	85.19%
		LS-SVM [L*a*b]	88.89%
Oranges	Shape Analysis & Recognition [Major length, Minor Length, area, Perimeter]	Bwboundaries SVM	Not Defined
Pears	Size,Shape,Color,Defects of Surface	HSI Model, Gaussian Distribution	-
Papaya	Mean Diameter	MLP- Back Propagation, OTSU Method Edge Detection	94.6%
Dates	Flabbiness,Size,Shape, Intensity & Defect	BP-NN	80%

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The global adaptation is to acquire a large application terrain and it performs the best use of the network globally .The challenge of the network is to achieve the end to end delay and minimization of intergroup routers for subsequent local adaptation. Here the hierarchical star topology is proposed based on R-tree for minimization of intergroup routers. The structure of the R-tree is a multidimensional tree that has a number of M objects into minimum bounding rectangle. At every next higher level in the tree, the M type rectangles are aggregated into larger boundary rectangles. The value of M is determined by applying k-means clustering.

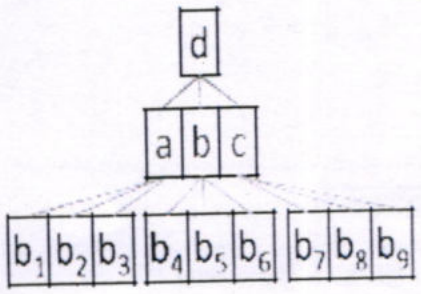

Figure.6. Structure of R-Tree

Consider M is average of the clusters that is

$$M=\text{TM}^{k}_{i=1}\ \check{N}\&L\check{N}\,N$$

Where k-no of clusters

Ci -no of bridge routers in the ith cluster Ci

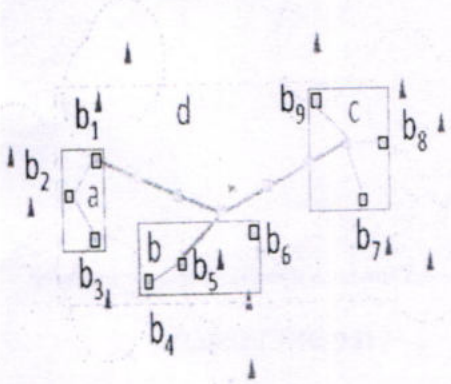

Figure.7. Global Adaptation

IV.PERFORMANCE ANALYSIS

The capability of AMMNET in adapting a dynamic movement of mobile clients and forwarding the data in network is efficient. Here the performance of AMMNET with ORACLE scheme is evaluated. The routers in an AMMNET can be able to adapt their locations using locally cached location information .When the number of free routers of user groups reaches the predefined threshold point, the global adaptation is performed. In ORACLE, the location information of the clients is available due to centralized scheme .It can be used only for the purpose of performance comparison. ORACLE develops the R-tree using the correct location of the mobile users. Though the ability of ORACLE is more enough to transmit the data, this scheme is not suitable for higher density of clients.The figure shows that the average throughput and packet delivery ratio obtained in AMMNETs are higher than that in Oracle scheme.

x Packet Delivery Ratio:

The term Packet Delivery Ratio is defined as the ratio of packets that are successfully delivered to a destination compared to the number of packets that have been sent out by the sender.

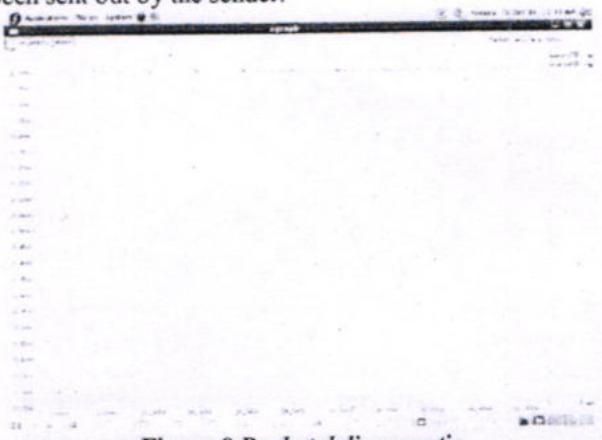

Figure.8.Packet delivery ratio

From Fig.8. the Packet Delivery Ratio for AMMNET is increased and maintained but in ORACLE it reduces.

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Throughput:

Network throughput is the average rate of successful message delivery over a communication channel.

Figure.9. Throughput

From Figure.9, The Throughput for AMMNET has been increased at a higher rate when compared to ORACLE.

VI.RESULT AND DISCUSSION

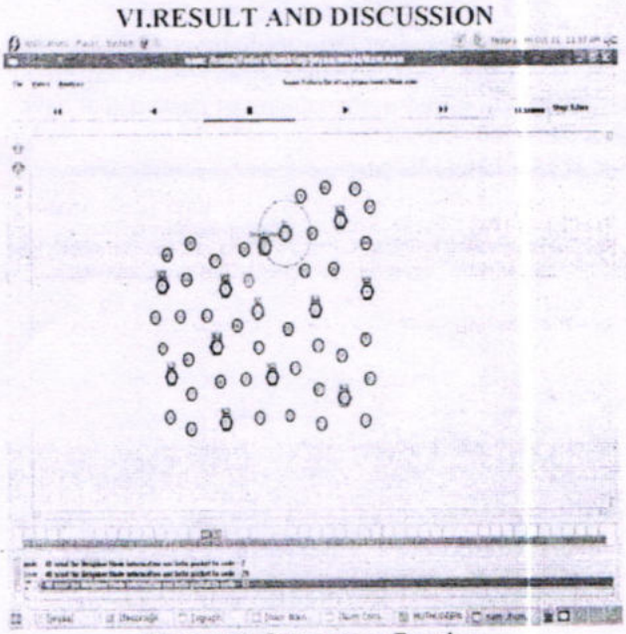

Figure.10. Intergroup Routing

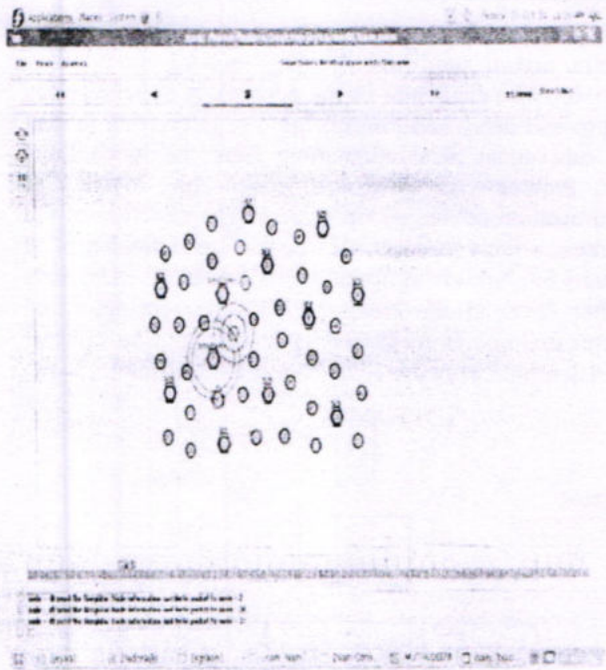

Figure.11. Intragroup Routing

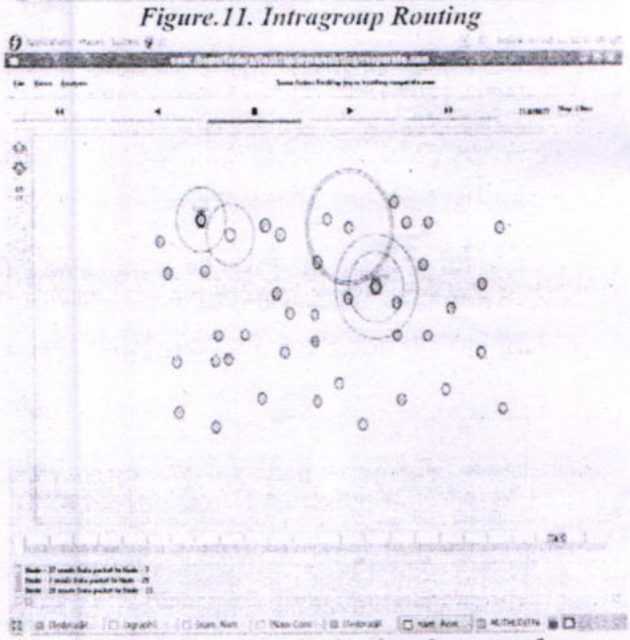

Figure12.Source to destination data transfer

VII.CONCLUSION

Applications involved such as communication in battlefield and crisis management, the mobile users work in dynamically formed groups for a large

application terrain. For such applications there is currently no cost effective solution. Though an AMMNET is an efficient method in reduction of network partitioning still many interesting issues not yet examined such as searching for disappearing mobile clients, minimizing routing paths, utilizing non overlapping channels etc. These challenges can be solved by future research.

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Biometric Verification Using Face Recognition

Drishant Sharma, Adithya B.S., B. Bharadwaj and
Y. Sanjanna

Abstract— *Real time challenges are eternal for verification & recognition of a person.*

"An image is worth more than ten thousand words!!"

Automatic detection/recognition of people is a challenging problem which has received much attention in the recent years. Face recognition concept is one of the successful & important application of image analysis. It's a holistic approach towards technology & has potential applications in various fields.

This paper provides an overview of real time applications of face recognition concept. We have proposed an efficient algorithm by generating a code based on MATLAB platform. The basic techniques which we have used are categorized into 2 parts i.e. Feature based including skin color model, geometry based model; and template matching. We have also discussed about various color space models.

We have segmented the various parts of the face using mapping and then made use of Viola Jones method & Artificial Neural Networks which includes Gabor filter in order to compare the test image with the images in our database to find the similarities and hence recognize the person.

Keywords— *Face Recognition, Viola Jones, Gabor Filter, Artificial Neural Networks Template Matching*

I. Introduction

"You may delay, but time will not" as said by Benjamin Franklin, time is very precious. Every time a lecture, section or laboratory starts, the lecturer or the teaching assistant delays the lecture to record attendance of the students. This is a lengthy process and takes a lot of time and effort. Especially if it is a lecture with a huge number of students. It also causes a lot of disturbance and interruption when an exam is being held. Moreover the attendance sheet is subjected to damage and loss while being passed on between different students or the teaching staff. Apart from wastage of time while taking attendance there are few other problems such as false attendance popularly known as "proxy", lack of dedicated time for teaching, resulting in incompletion of syllabus, maintaining records of attendance, mispronunciation of names. To find a solution of these we use the Advanced Digital Image Processing and its real time application using MATLAB.

The main advantage of biometric systems over the normal automated system is that they really do what they are supposed to do, which is authenticating the user, in a way initiating the human capabilities; and using real human physical characteristics, which are unique for all and impossible to change. In addition, some researches proposed that biometrics are not subjected to theft, loss or passing to anyone else like what is done with cards or passwords. While some other objects point out that they are not a secret and could be falsified or stolen from computer systems.

In today's era of fast growing biometric systems, several approaches of face detection have been proposed. In this algorithm a method for face detection in color images has been implemented. Detecting of faces in color faces has become important for a face detection system, as the color being one of the timely and most useful components to extract skin regions. There are numerous color models that constitute an image viz. RGB, YCbCR, HSV color models. As a primary color model, we worked on RGB by specifying the general range for Red (R), Green (G) and Blue (B) color intensities.

II. Digital Image Processing

It is an area characterized by the need for extensive experimental work to establish the viability of proposed solution to a given problem. Digital image processing encompasses processes whose inputs d outputs are images and in addition, includes processes that extract attributes from images.

Image processing includes:-

1. Image display and printing
2. Image editing and manipulation
3. Image enhancement
4. Feature detection
5. Image compression

In this thesis, we are working with face detecti system which can detect static images. Human activity a major concern in a wide variety of applications such video surveillance, human computer interface and f

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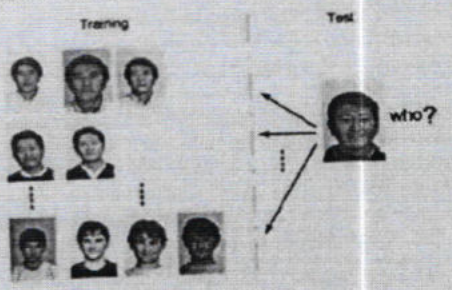
recognition. Detecting faces is the first and the most important step in these applications. Face detection can be viewed as a two-class (face vs non-face) classification problem. This skin patches are detected after applying lighting compensation technique. The facial features are subjected to verify feature maps for the eyes, mouth and face boundary. This approach is very much sensitive to illumination, color variations, hence we moved towards template matching.



III. Facial Feature Detection

- It is possible that some of the detected skin tone regions will include some non-face regions whose color is similar to the skin tone.
- The face feature detection module rejects face candidate regions that do not contain any facial features such as eyes, nose and face boundary.
- This module can detect multiple eye and mouth candidates.
- A triangle is constructed from two eye candidates and one mouth candidate and the smallest enclosing ellipse of the triangle is constructed to approximate the face boundary.
- A face score is computed for eyes, mouth and ellipse, and if it exceed threshold it is then considered as a face.

IV. Face Detection Approaches

The attempt to automate human recognition initiated the research in the field of face detection. The existence of variable illumination, complex background and d pose variation adds constraints to an efficient and robust face detection system. In this section, we review existing face detection techniques over a single intensity or color images. Image detection methods here are classified into 2 types:-

1. Feature based method
   A. Skin color based
   B. Geometry based
   C. Appearance based
   D. Edge based
2. Template matching

A. Artificial neural networks and Gabor filter

Skin Color Based

Human skin color has been used and proven to be an effective feature in many applications from face detection to and tracking. Although different people have different skin color, several studies have shown that the major difference lies largely between their intensity rather than their chrominance. The skin pixel detection in RGB space is difficult as it is not perceptually uniform and the color components are very sensitive to the intensity.

Geometry Based

Most of the face detection approaches utilize size and shape to find the face candidate and then verify these candidates using local, detailed features such as eye brows, nose, mouth and hair. A typical approach begins with the detection of skin like pixels, as mentioned above. Next, skin like pixels are grouped together connected component analysis or clustering algorithms. If a connected region has an elliptical or an oval shape, it becomes a face candidate.

The symmetry of face patterns has also been applied to face localization. A face triangle is drawn utilizing the eyes and mouth indicating a face candidate.

Appearance Based

Gray values are the most important parameter for the face detection. Face detection performance is effected by light intensity and occlusions. Contrasted to the template matching methods where the template are predefined by experts, the templates in appearance based methods are from the examples in the image. Appearance based methods rely on techniques from statistical analysis and machine learning to find the relevant characteristics of face and non-face images.

Edge Based

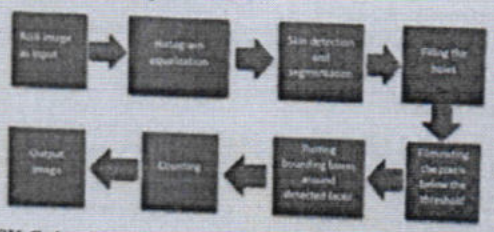
The edge information is extracted and used to detect face. These methods can handle large variations of the face images but require processing for illumination normalization. Edge detection is the foremost step in deriving edge representation. So far, many different types of edge operators have been applied. The Sobel operator was the most common filter among the techniques. A variety of first and second derivatives (Laplacian) of Gaussians have also been used in the other methods.

Template Matching

Input image is compared with predefined face template, pose and shape. In template matching, a standard face pattern (usually frontal) is manually predefined or parameterized by function. Given an input image, the correlation values with the standard pattern are computed for the face contour, eye, nose and mouth independently. The existence of face is determined based

on the correlation values. This approach has the advantage of being simple to implement. However, it has proven to be inadequate for face detection since it cannot effectively deal with the variation in scale, pose and shape. Multi resolution, multi scale, sub-templates and deformable templates have subsequently been proposed to achieve scale and shape invariance.

Block Diagram Representation



HSV Color Space

Hue (H) is a measure of the spectral composition of a color and represented as an angle, which varies from 0 to 360. Saturation (S) refers to the purity of colors and intensity of pixel is defined by the Value (V) which ranges from 0 to 1. HSV model is related to human color perception. Conversion from RGB to HSV color system is done using the following equations:-

$$H_1 = \cos^{-1}\frac{0.5[(R-G)+(R-B)]}{\sqrt{(R-G)^2+(R-B)(G-B)}}$$

$$H = H_1 \quad \text{if} \quad B \le G \qquad H = 360^\circ - H_1 \quad \text{if} \quad B > G$$

$$S = \frac{Max(R,G,B) - Min(R,G,B)}{Max(R,G,B)}$$

$$V = \frac{Max(R,G,B)}{255}$$

Condition in the HSV color space for skin regions:-

0<H<360

H>=0 && H<=50

S>=0.1 && S<=0.9

Face Detection Steps

The following steps are followed in order to find the regions where face may be found

1. Normalize the test image.
2. Take two template images from database and normalize them.
3. Apply 2-D convolution between test image and template images.
4. Find the regional maxima in both convolved images where the maximum found is set to 1 and all other regions are set to 0.
5. Combine the regional maxima of both the images into one image which will give the position where the face features may be found.

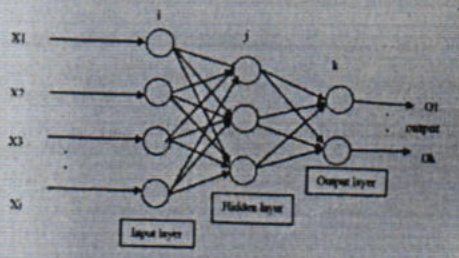
Algorithm

We are using Artificial Neural Networks for training our system for face and non-face data feature where our ANN has three layers, one input layer, one hidden layer and one output layer. The size of the hidden layer is fixed to 100 and the input layer is from -1 to +1. For calculation purpose, the hyperbolic tangent sigmoidal transfer function is used and is described as:-

$$A = \frac{2}{1+e^{-2n}} - 1$$

Where, n is the number of inputs to the ANN.

For checking the performance of the network, we have used the mean squared error with regularization performance function that measures the measures the network performance as the sum two factors, mean squared error and the mean squared weight, and the bias value. The scaled conjugate gradient back propagation function as been adapted for training the whole network.



Flow Chart Representation

Viola Jones Approach

The basic principle of the Viola Jones algorithm is to scan a sub window capable of detecting faces across a given input image. The standard image processing approach would be to rescale the input image to different sizes and then run the fixed size detector through these images. This approach turns out to be rather time consuming due to the calculation of the different size images. Contrary to the standard approach, Viola Jones rescale the detector instead of the input image and run the detector many times through the image – each time with a different size. At first, one might suspect both approaches to be equally time consuming, but Viola Jones have devised a scale invariant detector that requires the same number of calculations whatever the size. This detector is constructed using a so called integral image and some simple rectangular features reminiscent of Haar wavelets.

V. Conclusion

The algorithms mentioned above are in the hierarchical order of their complexity and accuracy. Skin color based algorithms like RGB, YCbCR and HSV methods could yield the output for simple images. However, they failed for the images which have complex background and poor or non-uniform illumination. Moving to the improved methods, we worked on geometrical features where eye and mouth parts were extracted using a method in which face triangle is drawn. This approach overcame the dependency of face area and complex background. However, it failed again in terms of poor illumination and in different orientations. Hence a better method would be the one which is independent of color variation and illumination. This directed us to work on template matching algorithms like Gabor filter and ANNs. For a class room environment constructing a database is not a problem. Since the classroom contains a pre-defined number of students. These databases are used to match with the test image, an image taken by the camera, in a real-time scenario. So far this is the best algorithm among the above mentioned and best suits for our problem statement.

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Architectural Pattern to Improve Business Application using Model View Controller

Prajwala R Reddy, G. Manjula and Dr.G. Mahadevan

Abstract— *In recent time, several new methods have been developed at a rapid pace. Some of the advancements in continuous years, new methods have been developed at a rapid pace. Some of the advancements in continuous optimization methods have been focused on comparison and contrasting nature of Evolutionary Algorithms and Gradient based methods. As a matter of fact, an Evolutionary algorithm is one of the best methods available for derivative – free optimization in higher dimensional problems. This approach will only make difference in the existing system, whereas the measuring metrics software platform varies in each application. Our approach applies to software architectures modelled with the Palladio Component Model. It supports quantitative performance, reliability, and cost prediction and can be extended to other quantitative quality criteria of software architectures. By adding a new component model in between the each system is more effective in measuring and easily suitable for any business application. In Software life cycle, the two key activities involved are Requirements Engineering and software architecting researchers are emphasizing on mapping and transformation of requirements to software architecture, but the lack of effective solution is still prevalent.*

Keywords— *Evolutionary Algorithm, PCM, Software Architecture, MVC*

I. Introduction

PALLADIO component model is a model which acts like Meta model for the designed application, where we can measure the performance, cost and reliability of a system. PCM is one of the high level design structure where software process can interface with the frame work. The software process for measuring the performance, reliability and cost we can use the software MAT Lab. The mat lab is one of the tools we can implement in the business application and measuring metrics. PCM can be used many ways. Prediction methods for performance and reliability of general software systems are still limited and rarely used in industry Component developers who produce components that are assembled by software architects and deployed by system allocators. The diverse information needed for the prediction of extra-functional properties is thus spread among these developer roles. PCM can also be used based on the different data set, where the behavioral skills of a data are data integrity.

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The following listing helps to classify thePalladio Component Model (PCM) which is underlying the Palladio approach. In case you are preparing taxonomy or try to identify whether specific features are supported by the PCM, this page assists our work. Supported quality dimensions

- Performance
- Reliability
- Costs
- Maintainability

Requirements engineering and software architecting are two important activities in software life cycle. Requirements engineering is concerned with purposes and responsibilities of a system. It aims for a correct, consistent and unambiguous requirements specification, which will become the baseline for subsequent development, validation and system evolution. In contrast, software architecting is concerned with the shape of the solution space. It aims at making the architecture of a system explicit and provides a blueprint for the succeeding development activities. It is obvious that there exist quite different perspectives in user (or customer) requirements and software architecture (SA).

1.1 Method

The transformation rule is applied to the UML, where each state of a system is ready to accept the query provided by the metrics system. The system will also available in java JSP pages, but the retrieval operation from each page will continuously affect the system. The process flow diagram mentioned in the Palladio component model [11]. The context for the method consists of a requirements specification that is taken as an input to the method and an architectural design generated as output. User interface are prone to change requests. An MVP is a basic platform to extend the performance of a designed system called M-ACCURATE approach. This approach is newly involved in the problem context while processing the sequence diagram. In Sequence diagram

An architecture design method has been presented that explicitly addresses the non-functional requirements put on the architecture. The simulated output will always measure the metrics of the business application. The new model which is inserted in between the existing model will prove that the quality of the metrics is improved. It has been identified that the ability of a system to fulfill its non-functional requirements is, up to a considerable extent, restricted by its architecture. The proposed method starts with a functionality-based design phase in which a software architecture is designed purely based on the functional requirements. The architectural design method has been applied, in some form, in the design of systems, Experience shows that the method is provide appreciated support to the software engineers during architectural design.

VII. CONCLUSION

An architecture design method has been presented that explicitly addresses the non-functional requirements put on the architecture. The simulated output will always measure the metrics of the business application. The new model which is inserted in between the existing model will prove that the quality of the metrics is improved. It has been identified that the ability of a system to fulfill its non-functional requirements is, up to a considerable extent, restricted by its architecture. The proposed method starts with a functionality-based design phase in which a software architecture is designed purely based on the functional requirements. The architectural design method has been applied, in some form, in the design of systems, Experience shows that the method is provide appreciated support to the software engineers during architectural design.

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Aerodynamic Design and Analysis of a Formula Vehicle Using CFD

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Abstract-The aerodynamic shape of a vehicle plays a vital role in improving the performance and efficiency the vehicle, which automatically decrease the consumption of fuel. To improve performance and efficiency addition of spoiler is done. In this study the aerodynamic design & steady state analysis of a formula vehicle has been carried out with, the addition of spoiler. The spoiler is designed and fixed on the vehicle at various angles from-5°to5°.The addition of spoiler increases the stability of the vehicle mainly during cornering also while sharp turns. The modelling of the vehicle is done in CATIA V5R18. The computational domain is created and the polyhedral mesh is adopted for the vehicle. The numerical simulation is carried out in STAR CCM+ commercial software using various turbulence models at three different speeds 75,100,125 KMPH. The results are compared for the vehicle with and without spoiler. It is concluded that the stability of the vehicle is increase by 30%, due to which the drag is increased by 9% for -5°angle of attack simulation when compared with 0° of angle of attack for without spoiler simulation.

Keywords: Aerodynamics; Formula Car; CFD; Spoiler; Lift and Drag.

1. INTRODUCTION

Aerodynamics plays a major role in vehicle performance and efficiency. The vehicle should be in Aerodynamic shape of the vehicle experiences only less amount of drag and the flow over the body becomes smoothly. Now days so many researches are going on to make a vehicle in to aerodynamic shape which will produce lesser amount of drag while the vehicle in motion. Spoiler is an automotive aerodynamic device, which will change the airflow around the body and resulting in increased turbulence. this will cause increased negative coefficient of lift which will stabilizing the vehicle and generate more ground effect.

Muthuvel*et al.* [1]carried out work for numerical simulation airflow over a formula one vehicle, the spoiler is fitted at rear side of the vehicles at different angles 0^0 and 5^0. The vehicle is operated at various speeds 80KMPH, 100 KMPH and 120KMPH. Analysis is carried out for F1 car with spoiler and in this unstructured polyhedral mesh was used and AKN k-ε turbulence model is used. He said that 0^0 spoiler gives less drag than 5^0.

Shyam P. Kodali*et al.* [2] made a numerical simulation of air flow over a passenger car without rear spoiler and compares these results with results obtained for a passenger car fitted with rear spoiler. Pressure based solver the k-ε turbulence model was used in the simulation. The vehicle is operated at various speeds 50,100, 180 and 250 KMPH and then the coefficient of lift is calculated. The vehicle fitted with spoiler gives low coefficient of lift, thereby increase in vehicle stability.

Richard G.J Flay*et al.* [3] studied the aerodynamic design of a formula SAE race car. the main objective of their research was to increase the down force generated by the vehicle, for that the exhaust was vented into two diffuser tunnels under the car. There by increase in the down force about 30%. They did both numerical modelling as well as the wind tunnel testing.

Luiz Antonio *et al.* [4] worked on design analysis improvements for a formula SAE racing car. ANSYS CFX software is used to predict the aerodynamic forces like lift, drag and aerodynamic flow path in order to find the way to decrease the drag and improve the down force generated by the car. Wind tunnel test was carried out to validate the results.1:5 reduced scale model was used for wind tunnel testing.

Xu-xia Hu *et al.* [5] carried out a Numerical study on Rear- spoiler of Passenger vehicle. They analysis a passenger vehicle for with and without spoiler. The standard k- ε turbulence model was used to simulate the flow field.24 different cases were simulated and results were compared. The high speed passenger car attached with rear spoiler shows increase in down force as well as reduction in drag.

SajjadBeigmoradi *et al.* [6] explained the Noise identification for a coupe passenger car by considering spoiler. The main cause for aerodynamic noise is due to fluctuations of pressure on external surface of body. ANSYS FLUENT 14 software is used for simulating the flow. HEXA element type is applied for volumetric meshing. The rear spoiler gives better vehicle stability at high speeds 90,120,140 (KMPH).bumper region produces more aerodynamic noise source and maximum acoustic power level for different relative angles also calculated.

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A Survey on Aware of Local-Global Cloud Backup Storage for Personal Purpose

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***Abstract*—According to the present scenario, the requirement for data protection in the personal computing environment has increased significantly. This is because the volume and value of digital information is growing rapidly. For protecting the data, it is the needed to have a good backup and recovery plan. But the redundant nature of the backup data makes the storage a concern; hence it is necessary to avoid the redundant data present in the backup. Data de-duplication is one such solution that discovers and removes the redundancies among the data blocks. Actually data de-duplication scheme is motivated on personal storage. The proposed scheme improves data de-duplication efficiency by exploiting application awareness.**

***Index Terms*— Application awareness, Cloud backup service, Chunking schemes, Data redundancy, Data de-duplication, De-duplication efficiency, Hashing algorithm .**

I. INTRODUCTION

Data is the heart of any organization; hence it is necessary to protect it. Now-a-days, the backup has become the most essential mechanism for any organization. Backing up files can protect against accidental loss of user data, database corruptions, hardware failures, and even natural disasters. However, the large amount of redundancies which is found in the backups makes the storage of the backups a concern, thus utilizing a large of disk space. Data de-duplication comes as a rescue for the problem of redundancies in the backup. It is a capacity optimization technology that is being used to dramatically improve the storage efficiency. Data de-duplication eliminates the redundant data and stores only unique copy of the data.

Here instead of saving the duplicate copy of the data, data de-duplication helps in storing a pointer to the unique copy of the data, thus reducing the storage costs involved in the backups to a large extent.

It can help organizations to manage the data growth, increase efficiency of storage and backup, reduce overall cost of storage, reduce network bandwidth and reduce the operational costs and administrative costs.

The five basic steps involved in all of the data de-duplication systems are evaluating the data, identify redundancy, create or update reference information, store and/or transmit unique data once and read or reproduce the data. Data de-duplication technology divides the data into smaller chunks and uses an algorithm to assign a unique hash value to each data chunk called fingerprint. The algorithm takes the chunk data as input and produces a cryptographic hash value as the output. The most frequently used hash algorithms are SHA, MD5. These fingerprints are then stored in an index called chunk index. The data de-duplication system compares every finger-print with all the fingerprints already stored in the chunk index. If the fingerprint exists in the system, then the du-plicate chunk is replaced with a pointer to that chunk. Else the unique chunk is stored in the disk and the new fingerprint is stored in the chunk index for further process.

Many personal computing devices rely on a cloud storage environment for data backup. Source de-duplication for cloud backup services is faced by a critical challenge. It has low de-duplication efficiency because of the re-source intensive nature of de-duplication and the limited system resources.

In this paper, an Application-aware Local-Global source de-duplication scheme is proposed that combines local and global duplicate detection to strike a good balance between cloud storage capacity saving and de-duplication time reduction

II. CLOUD STORAGE

Cloud storage is a service model in which data is maintained, managed and backed up remotely and made available to users over a network.

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Cloud storage provides users with storage space and make user friendly and timely acquire data, which is foundation of all kinds of cloud applications. The storage cloud provides storage-as-a-service. The organization providing storage cloud uses online interface to upload or download files from a user's desktop to the servers on the cloud. Typical usage of these sites is to take a backup of files and data. Storage cloud exists for all the types of cloud. A cloud storage SLA is a service-level agreement between a cloud storage service provider and a client that specifies details of the service, usually in quantifiable terms.

A. Advantages Of Cloud Storage

Cloud storage has several advantages over traditional data storage. For example, if we store our data on a cloud storage system, we will be able to get that data from any location that has internet access. There is no need to carry around a physical storage device or use the same computer to save and retrieve our information. With the right storage system, we could allow other people to access the data.

III. DATA DE-DUPLICATION

The traditional backup solutions require a rotational schedule of full and incremental backup, which move a significant amount of redundant data every week. Most organizations also create a second copy of this information to be shipped to a secondary site for disaster recovery purposes. Thus aggregating, the costs of traditional backup in terms of bandwidth, storage infrastructure, and time increases the cost of IT organizations for information management. Backing up of redundant files and data increases the backup window size this results in over utilization of Network resources, and require too much additional storage capacity to hold unnecessary backup data.The organizations need solutions to manage this increasing information and data.

Thus de-duplication techniques can reduce your bandwidth requirements; it can improve the data transfer speed and maintain your cloud storage needs including cloud storage fees to a minimum.

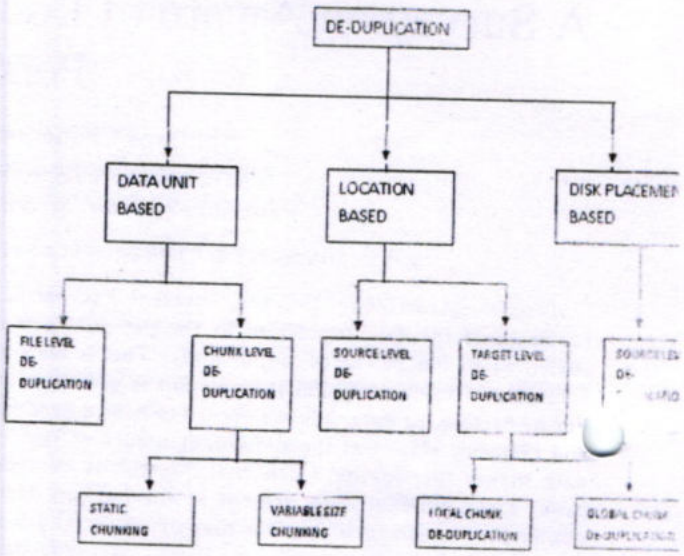

Figure 1:Data De-Duplication techniques

(1) Data unit based:

Here Data duplication strategies are basically classified in to File level de-duplication and Block (chunk) level de-duplication. In File level de-duplication only one copy of the file is stored. Two files are identical if they have the same hash value. On the other hand file is fragmented into blocks in Block level De-duplication and one copy of each block is stored. Each block may be fixed (static) or variable size chunk. In fixed size chunks, size of each block is same. In case of variable, size of each chunk is varies.

(2) Location based:

De-duplication can be categorized in to two b[illegible] approaches depending on the location where redundant [illegible] is to be eliminated [6]. In the target based approach, De-duplication is performed in the Destination storage system. Here client is not aware about strategies in de-duplication

The positive part of this method is storage utilization increases but bandwidth is not saved. The elimination of duplicate data is performed closed to where data is created in source based de-duplication.

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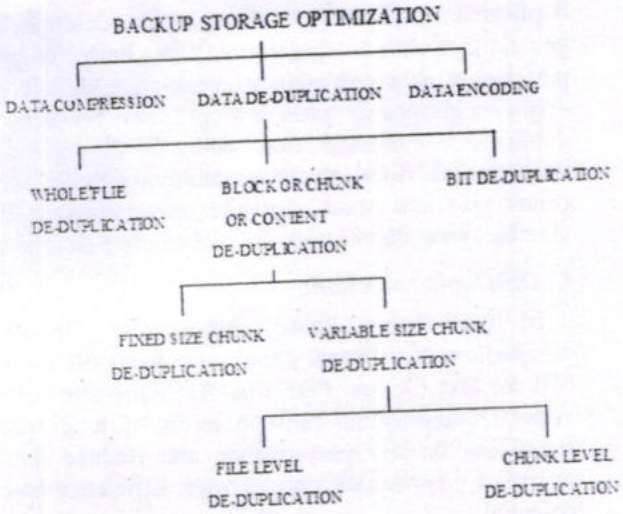
The source de-duplication approach is implemented at the client side. The client software communicates with the backup server by sending hash signatures to check for the existence of files or block. The duplicate are replaced by pointers and the actual duplicate data is never sent over the network.

(3) Disk Placement based de-duplication:

Backward reference de-duplication and Forward reference de-duplication are two major classifications in Disk placement. In backward reference the recent redundant data chunks are associated with pointers that point backward to the older identical data chunks. In case of forward reference de-duplication the recent redundant data chunks are maintained in their entirety and all the old identical data chunks are associated with pointers that point forward to the recent data chunks.

B. De-Duplication Techniques:

The optimization of backup storage technique is shown below. The data de-duplication can operate at the whole file, block (chunk) and bit level.



C. De-Duplication Methods

Whole file de-duplication or single instance storage (SIS) finds the hash value for the entire file which is the file index.

If the new incoming file matches with the file index, then it is regarded as duplicate and it is made pointer to existing file index, If the new file is having new file index,then it is upgraded to the storage.Thus only single instance of the file is saved and subsequent copies are replaced with a pointer to the original file.

Block de-duplication divides the files into fixed-size block or variable-size blocks. For a fixed-size chunking, a file is partitioned into fixed-size chunks, for example each block with 8KB or 16KB.In variable-size chunking, a file is partitioned into chunks of different size. Both the fixed size and variable size chunking creates unique ID for each block using a hash algorithm such as MD5 or SHA-1.The unique ID is then compared with a central index. If the ID exists, then that data block has been processed and stored before.

Therefore, only a pointer to the previously stored data needs to be saved. If the ID is new, then the block is unique. The unique ID is added to the index and the unique chunk is stored. Block and Bit de-duplication looks within a file and saves unique iterations of each block or bit. This method makes block and bit de-duplication more efficient.

IV. EXISTING SYSTEM

Cloud computing is a technology which is used to provide resources as a service. There are many services provided by cloud provider, such as SAAS, IAAS, PAAS. The cloud computing provides the storage-as-a-service which is used to backup the user's data into cloud. The service is provided by cloud service provider which is effective, reliable and cost-effective. The existing backup scheduling provides the reliability by maintaining the same copy of the data twice, but the redundancy of the data is not considered. This does not consider much of the security issues. The limitations of the existing backup scheduling algorithm is improved is improved by proposing a backup scheduling algorithm(IBSD) which aims at reducing redundancy without compromising on availability.

The IBSD algorithm reduces redundancy by de-duplication techniques, which is used to identify the duplicate data and eliminates it by storing only one copy of the original data. If the duplicate occurs then the link will be added to the existing data.

Also, the data de-duplication reduces the storage capacity needed to store or the data to be transferred on the network. Source de-duplication is useful in cloud backup that saves network bandwidth and reduces network space.

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To identify similar segments we use block index technique. The problem is that these schemes require a full chunk index, which indexes every chunk, inorder to determine which chunks have already been stored, it is impractical to keep such an index in RAM and a disk based index.

In this paper we describe application based de-duplication approach and indexing scheme which contains block that preserves caching and maintains the locality of the fingerprint of duplicate content to achieve high hit ratio and to overcome the lookup performance and reduced cost for cloud backup services and increase de-duplication efficiency. To improve space utilization and reduce network congestion, cloud backup vendor's (CBVs) always implement data de-duplication in the source and the destination. Towards integrating source and destination, we mainly focus on two proposals.

One of the important things of this is benefit-cost model for users to decide in which degree the de-duplication executes in client and in cloud. This will give better reliability, quality of service etc. Combining, caching and pre-fetching the requirements of different cloud backup services, the read performance in the cloud backup systems can be improved.

V. Local-Global Source De-Duplication

Local source de-duplication only detects redundancy backup data set from the same device at the client side and only sends the unique data chunks to the cloud storage. Local source de-duplication eliminates intra-client redundancy with low duplicate elimination ratio by low-latency .Global source de-duplication performs duplicate check in backup data sets from all clients in the cloud side before data transfer over WAN. It has intra-client and inter-client redundancy with high de-duplication effectiveness by performing high-latency duplication detection on the cloud side.

In the traditional storage applications like file systems and storage hardware, each of the layers contains different kinds of information about the data they manage. Such information in one layer will not be available to any other layers. ADMAD improves redundancy detection by application specific chunking methods that exploit the knowledge about concrete file formats.

All the related and prior work related to de-duplication focus only on the effectiveness of de-duplication. They are designed to remove more redundancy from the data.

Earlier systems have not considered the system over-heads for high efficiency in de-duplication process.

A) Design And Implementation

ALG-dedupe is designed to meet the requirement of de-duplication efficiency with high de-duplication effectiveness and low system overhead. The main idea of ALG-dedupe is (1)exploiting both low-overhead local resources and high-overhead cloud resources to reduce the computational overhead by employing an intelligent data chunking scheme and an adaptive use of hash functions.(2)to mitigate the on-disk index lookup by dividing the full index into small independent and application specific indices in an application aware index structure. It combines local-global source de-duplication with application awareness to improve de-duplication effectiveness with low system overhead on the client side.

B) Architecture

An architectural overview of ALG-dedupe is illustrated below, where tiny files are first filtered out by file size filter for efficiency reasons and backup data streams are broken into chunks by an intelligent chunker using an application aware chunking strategy.

Data chunks from the same type of files are then de-duplicated in the application aware de-duplicator by generating chunk fingerprints in hash engine and performing data redundancy check in trade off between duplicate elimination ratio de-duplication overhead, we de-duplicate compressed files with WFC, separate static uncompressed files into fix-sized chunks by SC with ideal chunk size and break dynamic uncompressed files into variable sized chunks with optimal average chunk size.

C) DE-Duplication Ratio

In the above figure shows that De-duplication comparison of different chunk size from file contains 20 MB for text file and PDF file. As chunk size increases it affect De-duplication ratio in terms of time factor .For improving backup performance and Reduce the system overhead, improve the data transfer. Efficiency on cloud is essential.

So that we use various chunking strategy such as CDC and static Chunking for improving running performance of the system and increase De-duplication ratio. Variation in chunk size affects De-duplication efficiency. Maintaining threshold size of chunk we get better De-duplication ratio pdf as well as text files.

A Glance at Li-Fi (Light-Fidelity) and its Applications

Diva R. Krishnan, George Varghese M. and P. Kalamani

Abstract— *Li-fi stands for Light-Fidelity. Li-Fi provides transmission of data through illumination by sending data through an LED light bulb that varies in intensity faster than the human eye can follow.The more we become dependent upon the'cloud' or our own 'media servers' to store all of our files, including movies,music, pictures and games, the more we require bandwidth and speed. Therefore RF-based technologies such as today's Wi-Fi are not the optimal way.In addition, Wi-Fi may not be the most efficient way to provide new desired capabilities such as precision indoor positioning and gesture recognition.Optical wireless technologies, sometimes called visible light communication(VLC)and more recently referred to as Li-Fi, on the other hand, offers an entirely new paradigm in wireless technologies in terms of communication speed, flexibility and usability.This paper focuses on developing a Li-Fi based system and analyses its performance with respect to existing technology.*

Index Terms— *Wi-Fi(Wireless-Fidelity), Li-Fi(Light-Fidelity), LED(Light Emitting Diode), VLC(Visible Light Communication)*

I. INTRODUCTION

Li-Fi comprises a wide range of frequencies and wavelengths, from the infrared through visible and down to the ultraviolet spectrum. It includes sub-gigabit and gigabit-class communication speeds for short, medium and long ranges, and unidirectional and bidirectional data transfer using line-of-sight or diffuse links, reflections and much more. Transfer of data from one place to another is one of themost important day-to-day activities. The current wirelessnetworks that connect us to the internet are very slow when multiple devices are connected. As the number of devices that access the internet increases, the fixed bandwidth available makes it more and more difficult to enjoy high data transfer rates and connect to a secure network.

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A solution to this problem is by the use of Li-Fi.Li-Fi is the transmission of data through illumination by taking the fiber out of fiber optics by sending data through an LED light bulb that varies in intensity faster than the human eye can follow. It is not limited to LED or laser technologies or to a particular receiving technique. Li-Fi is a framework for all of these providing new capabilities to current and future services, applications and end users. This brilliant idea was first showcased by Harald Haas from University of Edinburgh, UK, in his TED Global talk on VLC. He explained "Very simple, if the LED is on, you transmit digital 1; if it's off,you transmit a 0. The LEDs can be switched on and off very quickly, which gives nice opportunities for transmitting data".

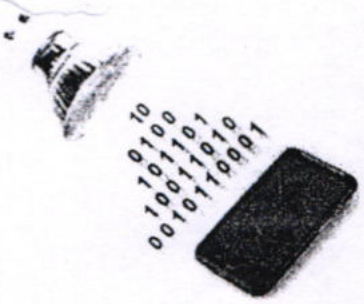

Fig. 1: Overview of LI-FI

Li-Fi can be the technology for the future where data for laptops, smart phones, and tablets will be transmitted through the light in a room. Security would not be an issue because if you can't see the light, you can't access the data. As a result, it can be used in high security military areas where RF communication is prone to eavesdropping.

II. CONSTRUCTION OF LI-FI SYSTEM

Li-Fi is a fast and cheap optical version of Wi-Fi. It is based on Visible Light Communication (VLC). VLC is a data communication medium that uses visible light between 400 THz (780 nm) and 800 THz (375 nm) as an optical carrier for data transmission and illumination. It uses fast pulses of lightto transmit information wirelessly. The main components of Li-Fi system are as follows:

a) A high brightness white LED which acts as a transmission source.

b) A silicon photodiode with good response to visible light as the receiving element.

LEDs can be switched on and off to generate digital strings of different combination of 1s and 0s. To generate

a new data stream, data can be encoded in the light by varying the flickering rate of the LED. The LEDs can be used as a sender or source, by modulating the LED light with the data signal.

The LED output appears constant to the human eye by virtue of the fast flickering rate of the LED. A communication rate of greater than 100 Mbps is possible by using high speed LEDs with the help of various multiplexing techniques. VLC data rate can be increased by parallel data transmission using anarray of LEDs where each LED transmits a different data stream. The Li-Fi emitter system consists of 4 primary sub – assemblies.

a) Bulb
b) RF power amplifier circuit (PA)
c) Printed circuit board (PCB)
d) Enclosure

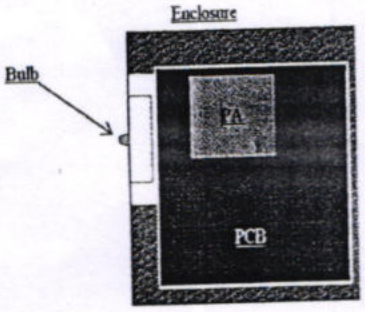

Fig. 2: Block Diagram of LI-FI Sub-Assemblies

The PCB controls the electrical inputs and outputs of the lamp and houses the microcontroller used to manage different lamp functions. An RF (radio-frequency) signal is generated by the solid-state PA and is guided into an electric field about thebulb. The high concentration of energy in the electric field vaporizes the contents of the bulb to a plasma state at the bulb's center; this controlled plasma generates an intense source of light.

III. Working Technology of Li-Fi

The working of Li-Fi is very simple. There is a lightemitter on one end, for example, an LED, and a photo detector (light sensor) on the other. The photo detector registers a binary one when the LED is on; and a binary zero if the LED is off. To build up a message, flash the LED numerous timesor use an array of LEDs of perhaps a few different colors, to obtain data rates in the range of hundreds of megabits per second.

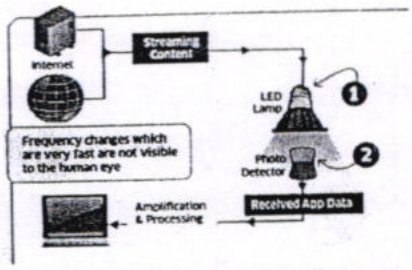

Fig. 3: Block Diagram of LI-FI System

Many other sophisticated techniques can be used todramatically increase VLC data rate. Teams at the University of Oxford and the University of Edinburgh are focusing onparallel data transmission using array of LEDs, where each LED transmits a different data stream. Other groups are using mixtures of red, green and blue LEDs to alter the light frequency encoding a different data channel.

IV. Comparison between LI-FI &WI-FI

Li-Fi is the name given to describe visible light communication technology applied to obtain high speed wireless communication. It derived this name by virtue of the similarity to Wi-Fi. Wi-Fi works well for general wireless coverage within buildings, and Li-Fi is ideal for high density wireless data coverage inside a confined area or room and for relieving radio interference issues.

TECHNOLOGY	SPEED
Wi-Fi – IEEE 802.11n	150 Mbps
Bluetooth	3 Mbps
Li-Fi	>1 Gbps
IrDA	4 Mbps

Parameter	LI-FI	WI-FI
Speed	***	*
Range	*	***
Data density	***	*
Security	***	*
Reliability	**	***
Power available	***	*
Transmit/receive power	***	*
Ecological impact	*	***
Device-to-device connectivity	***	*
Obstacle interference	***	*
Bill of materials	***	*
Market maturity	*	***

* low ** medium *** high

V. Advantages of Li-Fi

a) Capacity: Light has 10000 times wider bandwidththan radio waves.Also, light sources are alreadyinstalled. So, Li-Fi has got better capacity and also the equipment are already available.

b) Efficiency: Data transmission using Li-Fi is verycheap. LED lights consume less energy and are highly efficient.

c) Availability: Availability is not an issue as light

sources are present everywhere. There are billions of light bulbs worldwide; they just need to be replaced with LEDs for proper transmission of data.

d) Security: Light waves do not penetrate through walls. So, they can't be intercepted and misused.

VI. Disadvantages of Li-Fi

One of the major demerits of this technology is that the artificial light cannot penetrate into walls and other opaque materials which radio waves can do. So a Li-Fi enabled end device (through its inbuilt photo-receiver) will never be as fast and handy as a Wi-Fi enabled device in the open air. Also, another shortcoming is that it only works in direct line of sight.

Still, Li-Fi could emerge as a boon to the rapidly depleting bandwidth of radio waves. And it will certainly be the first choice for accessing internet in a confined room at cheaper cost.

VII. Applications of Li-Fi

Some of the future applications of Li-Fi are as follows:

a) Education systems: Li-Fi is the latest technology that can provide fastest speed internet access. So, it can replace Wi-Fi at educational institutions and at companies so that all the people can make use of Li Fi with the same speed intended in a particular area.

b) Medical Applications: Operation theatres (OTs) do not allow Wi-Fi due to radiation concerns. Usage of Wi-Fi at hospitals interferes with the mobile and pc which blocks the signals for monitoring equipment. So, it may be hazardous to the patient's health. To overcome this and to make OT tech savvy, Li-Fi can be used to access the internet and to control medical equipment. This can even be beneficial for robotic surgeries and other automated procedures.

c) Cheaper Internet in Aircrafts: The passengers travelling in aircrafts get access to low speed internet at a very high rate. Also Wi-Fi is not used because it may interfere with the navigational systems of the pilots. In aircrafts Li-Fi can be used for data transmission.

Li-Fi can easily provide high speed internet via every light source such as overhead reading bulb, etc. present inside the airplane.

d) Underwater applications: Underwater ROVs (Remotely Operated Vehicles) operate from large cables that supply their power and allow them to receive signals from their pilots above. But the tetherused in ROVs is not long enough to allow them to explore larger areas. If their wires were replaced with light — say from a submerged, high-powered lamp — then they would be much freer to explore. Li-Fi can even work underwater where Wi-Fi fails completely, thereby throwing open endless opportunities for military operations.

f) Traffic management: In traffic signals Li-Fi can be used which will communicate with the LED lights of the cars which can help in managing the traffic in a better manner and the accident numbers can be decreased. Also, LED car lights can alert drivers when other vehicles are too close.

e) Disaster management: Li-Fi can be used as a powerful means of communication in times of disaster such as earthquake or hurricanes. The average people may not know the protocols during such disasters. Subway stations and tunnels, common dead zones formost emergency communications, pose no obstruction for Li-Fi. Also, for normal periods, Li-Fi bulbs could provide cheap high-speed Web access to every street corner.

VIII. Conclusion

The concept of Li-Fi is attracting a lot of eye-balls because it offers a genuine and very efficient alternative to radio based wireless. It has a bright chance to replace the traditional Wi-Fi because as an ever increasing population is using wireless internet, the airwaves are becoming increasingly clogged, making it more and more difficult to get a reliable, high-speed signal. This concept promises to solve issues such as the shortage of radio-frequency bandwidth and boot out the disadvantages of Wi-Fi. Li-Fi is the upcoming and on growing technology acting as competent for various other developing and already invented technologies.

At present, finding the ideal position for a wireless router is something of a divine art. If the signal could be passed via VLC from Point A to Point B inside a home, small local routers at both points could create local fields with less chance of overlapping and interfering with each other. Large scale areas that are saturated with radio signals or that doesn't permit them for security reasons could use Li-Fi as an alternate high-speed wireless network solution.

Hence the future applications of the Li-Fi can be predicted and extended to different platforms and various walks of human life.

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Sl.No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISBN/ISSN number	Link of the recognition in UGC enlistment of the Journal
1	Securing Wireless Sensor Network Using PBK Mechanism	Miss Arpitha Vasudev	Computer Science and Engineering	IJERT	2014-15	2278-0181	https://www.ijert.org/ncrts-2015-volume-3-issue-27
2	Optimizing AODV protocal for minimizing routing path within mobile nodes in AMMNET	Ms. Sowmya. A M	Computer Science and Engineering	NCRTS	2014-15	2278-0181	https://www.ijert.org/research/optimized-aodv-protocol-for-minimizing-routing-path-within-mobile-nodes-in-ammet-IJERTCONV3IS27068.pdf
3	crystal structure of Nitro Derivatives of Ethyl (2E)-2-Cyano – 3 Phenyl prop – 2-enoate: Inputs from X – ray Diffraction, DFT Calculations and Hirshfeld surface Analysis.	Mr. Prakash V	Physics	Journal of Chemical Crystallography	2014-15	ISSN 1074-1542	https://www.ugc.ac.in/journallist/subjectwisejurnallist.aspx?tid=Sm91cm5hbCBvZiBDaGVtaWNhbCBDcnlzdGFsbG9ncmFwaHk=&&did=Q3VycmVudCBhbmQgQ2Vhc2VkIFRpdGxlcw==
4	Automated Method for Cancer Pinpoint Using Magnetic Resonance Imaging - A Theoretical Study	Y.Saanjanna	Computer Science and Engineering	International Journal of Innovative Research in Science, Engineering and Technology	2014-15	ISSN(Online) : 2319 - 8753	http://www.ijirset.com/upload/2015/multicon/cse/13_ICCTS133.pdf
5	"Factorial Design Application For The Protection Of Mild Steel From Corrosive Medium Using Castor Seed Oil As Inhibitor" International Journal of chemtech Research	Dr.S.Harikrishna	Chemistry	International Journal of hem.. tech Research	2014-15	ISSN 0974-4290	http://www.ijirset.com/upload/2015/multicon/cse/13_ICCTS133.pdf

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Securing Wireless Sensor Network using PBK Mechanism

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***Abstract*— Mobile sinks (MSs) are indispensable in numerous wireless sensor system (WSN) applications for productive information collection, confined sensor reconstructing, and for recognizing and denying traded off sensors. Wireless sensor systems (WSN) have gotten to be progressively main stream in checking situations, for example, calamity alleviation operations, seismic information gathering, checking natural life and military knowledge. The sensor regularly comprises of little, cheap, battery-fueled sensing gadgets fitted with remote transmitters, which can be spatially scattered to shape an impromptu progressively organized system. In this paper we utilize polynomial bivariate key to secure between the versatile sink and sensor hubs. By utilizing polynomial bivariate remarkable Id imparts between the portable sink furthermore, sensor hub.**

Key words*—Mobile Sink, polynomial bivariate key Security, Wireless Sensor Network.

I. INTRODUCTION

WSNs have been conveyed in diverse situations, counting fiasco help operations, seismic information accumulation, observing untamed life and front line administration/military brainpower. Sensors can be introduced in a mixed bag of situations and ordinarily secure a remote system foundation to impart and trade data into their working range. The sensor hub is described by constrained figuring force and subsequently has a low cost. Because of their little size, sensors can be spatially scattered to shape a specially ad hoc system. Hence, WSNs oblige a fitting cryptosystem to guarantee secure correspondence and shared trust between their segment hubs. In this situation, key administration turns into an issue of foremost significance since the greater part of the encryption-related primitives oblige the utilization and conveyance of keys in their operations.

In a considerable lot of these applications, sensor hubs transmit basic data over the system; in this manner, security administrations, for example, verification and pairwise key foundation between sensor hubs and versatile sinks, are vital. Then again, the asset imperatives of the sensors furthermore, their tendency of correspondence over a wireless medium makes information privacy and uprightness a nontrivial undertaking. Customary plans in specially ad hoc systems utilizing deviated keys are lavish due of their stockpiling and reckoning taken a toll. These restrictions make key predistribution plans the devices of decision to give minimal effort, secure correspondence between sensor hubs and versatile sinks. Notwithstanding, the issue of validation and pairwise key foundation in sensor systems with MSs is still not tackled even with portable sink replication assaults. For the essential probabilistic and q-composite key predistribution plans, an aggressor can without much of a stretch get an expansive number of keys by catching a little division of the system sensor hubs, making it workable for the assailant to take control of the whole system by conveying an imitated versatile sink, preloaded with some bargained keys to validate and at that point launch information correspondence with any sensor hub. To address the aforementioned issue, we have added to a general system that allows the utilization of any pairwise key predistribution plot as its essential segment, to give verification and pairwise key foundation between sensor hubs and MSs.

The high computational expense of the strongest accessible strategies (e.g.,Diffie Hellman key administration [1] or Rivest Shamir Adleman encryption [2]) make the majority of them not suitable for utilization in a WSN, portrayed by "equipment compelled" gadgets, so that the utilization of "plain" symmetric cryptography turns into an unavoidable decision. Moreover, additionally the key measurement also, the quantity of possibly prestorable keys might turned into a huge hindrance to the organization of solid cryptographic procedures on these minor gadgets because of their constrained measure of accessible memory. The last imperative issue is vitality utilization, which is generally known to expand relatively to the processing endeavors [2], for example, the ones needed by solid cryptosystems. In 2011, Xia et al. [3] concentrated on tending to the vitality productivity issue in sensor systems.

The symmetric-key based methodology obliges complex key administration, absences of adaptability, and is not versatile to extensive quantities of hub trade off assaults subsequent to the message sender and the beneficiary need to impart a mystery key. The imparted key is utilized by the

sender to create a message confirmation code (MAC) for every transmitted message. In any case, for this system, the legitimacy and trustworthiness of the message must be confirmed by the hub with the imparted mystery key, which is for the most part imparted by a gathering of sensor hubs. An interloper can trade off the key by catching a single sensor hub. What's more, this system does not work in multicast systems. In this paper we utilize the polynomial bivarent key trade be utilized for the safe information transmit between the versatile sink and sensor hub. In rest of paper we clarify the proposed framework and execution assessment of proposed framework.

II. RELATED WORK

In [1], [2] hash based and symmetric confirmation plans were proposed for WSNs. In these plans, every symmetric confirmation key is imparted by a gathering of sensor hubs. A gatecrasher can bargain the key by catching a solitary sensor hub. Along these lines, these plans are not strong to hub bargain assaults. Another sort of symmetric-key plan obliges synchronization among hubs. These plans, including TESLA [5] and its variations, can likewise give message sender validation. On the other hand, this plan obliges beginning time synchronization, which is not simple to be executed in substantial scale WSNs. In expansion, they additionally present postpone in message verification, and the postponement increments as the system scales up. A mystery polynomial based message verification plan was presented in [3]. This plan offers data theoretic security with thoughts like a limit mystery imparting, where the edge is dead set by the level of the polynomial. At the point when the quantity of messages transmitted is underneath the edge, the plan empowers the middle hub to check the genuineness of the message through polynomial assessment. Then again, when the quantity of messages transmitted is bigger than the limit, the polynomial can be completely recouped and the framework is totally broken. To expand the edge and the multifaceted nature for the interloper to remake the mystery polynomial, an arbitrary commotion, additionally called an annoyance component, was added to the polynomial in [4] to defeat the enemy from processing the coefficient of the polynomial. In any case, the included irritation component can be totally uprooted utilizing mistake remedying code strategies [6]

For the open key based methodology, every message is transmitted alongside the computerized mark of the message produced utilizing the sender's private key. Each transitional forwarder what's more, the last beneficiary can validate the message utilizing the sender's open key. The late advance on ECC demonstrates that people in general key plans can be more invaluable in wording of memory utilization, message many-sided quality, and security strength, since open key based methodologies have a basic furthermore, clean key administration [9]. The current unknown correspondence conventions , are generally originated from either mixnet [11] or DC-net [12]. A blend net gives obscurity by means of parcel reshuffling through an arrangement of blend servers (with at minimum one being trusted). In a blend net, a sender encodes an active message, and the ID of the beneficiary, utilizing the open key of the blend. The blend aggregates a clump of encoded messages, decodes and reorders these messages, furthermore, for- wards them to the beneficiaries. Since mixnet-like conventions depend on the factual properties of the foundation movement, they can't give provable secrecy. DC-net [4], [7] is an unknown multi-party calculation plan. A few sets of the members are obliged to impart mystery keys. DC-net gives flawless (data theoretic) sender namelessness without obliging trusted servers. Notwithstanding, in DC-net, stand out client can send at once, so it takes extra data transfer capacity to handle impact and controversy. As of late, message sender namelessness taking into account ring marks was presented [20]. This methodology empowers the message sender to create a source unknown message signature with substance realness confirmation. To create a ring mark, a ring part haphazardly chooses an AS and fashions a message signature for every single other part. At that point he utilizes his trap-entryway data to paste the ring together. The unique plan has exceptionally restricted adaptability and high multifaceted nature. In addition, the first paper just centered around the cryptographic calculation, and the important system issues were left unaddressed.

III. PROPOSED WORK

Purpose of this paper is to provide security to the nodes and the mobile sink. Data need to be protected which is transmitting between the sink and the node. When an attacker attacks either sink or the node data should be safe so we need a security mechanism for the safety of the private data.

In this paper polynomial bivariate key (PBK) is used for the security of data. By using this mechanism of security data is made secured and safe.

A. Generation of PBK

Polynomial key predistribution technique utilizes the polynomial math keeping in mind the end goal to produce key pool and perform key task among the included gatherings. A key appropriation server (KDS), performs disconnected from the net appropriation of a few polynomial shares of degree k to a set of hubs so that any k clients have the capacity to ascertain a normal key that can be utilized as a part of their interchanges with no sort of cooperation. By assessing its own particular put away polynomials with the identifiers (ID) of the other (k − 1) gatherings, every hub can focus a typical key, autonomously imparted to alternate hubs.

Blundo et al. [5] proposed a bivariate polynomial f(x,y) that can be used to register the key; the parameters (x,y) were taken as individual ID for sensor x and y. Like this the keys will be distributed to all the nodes involved in the transmission of the data from node to the sink. PBK even have the symmetric property.

In a specific wireless sensor network all the nodes will have their individual ID. In the first step of the network deployment only KDS will distribute the key to all the nodes. The polynomial will be stored in the node memory for future use.

B. *Properties of PBK technique*

The primary quality of the polynomial bivariate key pre appropriation plan is that there is no overhead amid the hub to-hub pair savvy key foundation action. The fundamental known disadvantage, then again, is the "Ksecurity" property: a k-degree plan is just vigorous against coalitions of up to k bargained hubs [7]. Until the quantity of bargained hubs is kept lower than k, regardless of the fact that all the bargained hubs impart their mystery information, the obscure coefficients of the polynomial can't be ascertained. On the other hand, when more than k hubs are bargained, the coefficients can be dead set from the blend of all the accessible information.

So, by using this PBK technique data security is done effectively. This was the main concern in the WSN and mobile sinks.

C. *System Model*

The portable sink predistributes the polynomial plan parameters to the sensor hubs. Portable sink pick two prime numbers haphazardly and process hash chain capacity. The portable sink arbitrarily chooses two polynomials from the k ones for n sensor hubs, and afterward stores the bivariate polynomial on these nodes.The sensor hubs can utilize the bivariate polynomial to build the pairwise session keys along the already decided ways. Every Ni sensor hub telecasts its exceptional ID to the Nk sensor hub also, the Nk sensor hub answers with its exceptional Nk ID to sensor hub Ni . The sensor hubs get the related special ID from the neighbor hubs and process the session key. At that point portable sink hub gives the confirmations to sensor hubs. The portable sink use it ID and hub ID process the message. Portable sink check the hub ID is match to the message. In the event that its match versatile sink permit to the correspondence else that hub expel from our system

IV. SIMULATION RESULTS

We have used NS2 simulator to show the simulation results. In that, we have used mobility model as the Random way point mobility model. And we have 15 nodes distributred in an area of 1500m ×1500m. Each node independently moving within the area specified area.

A. *Packet received*

The parcel got rate is characterized as the rate at which the destination got the information parcels. The rate is ascertained in light of the quantity of information bundles got every time. Higher the parcel got rate upgrades the execution of the system.

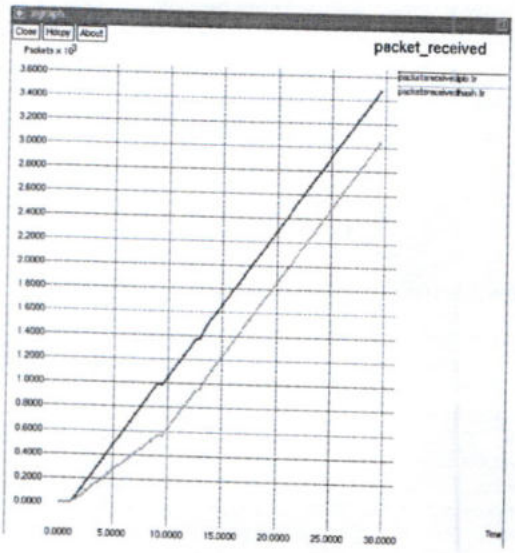

Fig. 1. Packet Received Ratio

B. *End to end delay*

Fig.2. demonstrates the end to end delay it characterizes number of bundle is send by a period. Our proposed plan in time postponement is lower than the current hash cryptography plan. In our system packer are send before then existing plan.

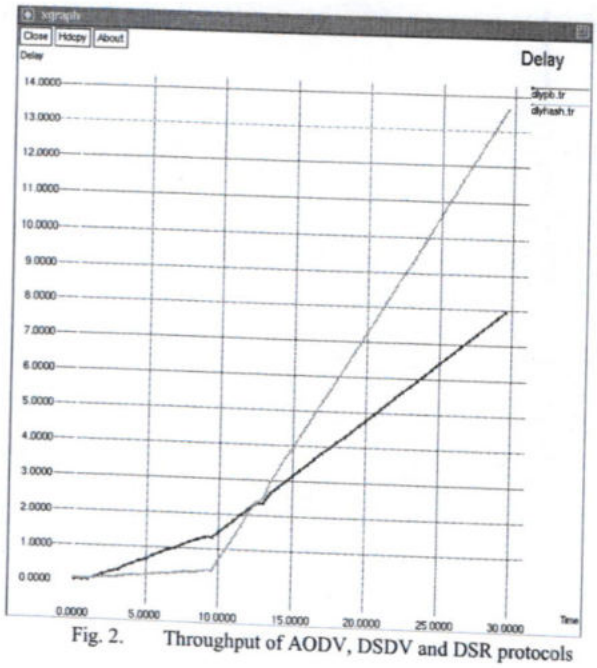

Fig. 2. Throughput of AODV, DSDV and DSR protocols

V. CONCLUSION

In this paper we utilize the polynomial bivariate key trade plan for remote sensor system with versatile sink. The key trade between the sink and the sensor hub of that just the validate hubs include in the correspondence different hubs are not include. The assailants are not recovering our unique data. We give the more security to the system. In future utilization advance security key trade strategy for more secures the correspondence. Future works go for planning application particular correspondence conventions to give security in the system to attain to far and away superior execution.

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Optimized AODV Protocol for minimizing Routing path within mobile nodes in AMMET

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***Abstract*— Autonomous Mobile Mesh Network (AMMNET) is another class of Mobile Ad-hoc Network (MANET), which is strong against network partitioning not at all like MANET. So these AMMNET are utilized as a part of emergency administration and combat zone correspondence, in which all users of group need to work in gathering scattered in application territory. Dissimilar to traditional mesh network, the mobile mesh nodes of an AMMNET are equipped for taking after the mobile users in the application territory, and arranging themselves into a suitable system topology to guarantee great network for both intragroup and intergroup interchanges. But routing of data and tracking mobile client makes mesh node drains more energy. This problem is addressed by introducing optimized AODV routing protocol in mobile clients such that mobile nodes will find the nearest path to destination or intergroup router. So that an efficient and secure path is found by mobile node to transmit data and the intragroup mesh node can only track mobile client.**

Index Words*— *Autonomous Mobile Mesh Network, Mobile Ad-hoc Network, Optimized AODV, Mobile Mesh Nodes, Mobile Clients

I. INTRODUCTION

Wireless communication technology is a standout amongst the most changing and empowering advancements. Mobile Ad Hoc NETwork (MANETs) is one of the mainstream wireless communication technologies. In MANET there is no pre-constructed framework for communication, such a network does not require any base for communication. Mobile nodes help to forward information parcels from source to destination node utilizing multiple-hop relay, and goes about as routers. Thus MANET is suitable where no altered framework is accessible or infeasible. The ad hoc network can be reused for diverse applications by migrating network in better places at distinctive time thus it is practical.

MANET is formed by number of nodes, which are dynamic in nature. The element way of nodes makes directing extremely troublesome, and leads to separation of courses often which influences network integration. This makes MANET to experience network apportioning. This limit makes MANET infeasible where colleagues need to work in groups for example, combat zone communication and emergency administration. An Autonomous Mobile Mesh Network (AMMNET) is a network which contains mobile clients and mesh node. The wireless mesh nodes contain multiple radios in single node which serves to handle multiple recurrence groups. These mesh nodes additionally have versatility, not at all like standard mesh network. Mobile mesh nodes in AMMNET move alongside mobile clients in application terrine, and build network topology and helps mobile clients to impart. At the point when mobile clients move in application terrine mobile clients following calculation is adopted to track the mobile clients by mesh node regarding portability of clients.

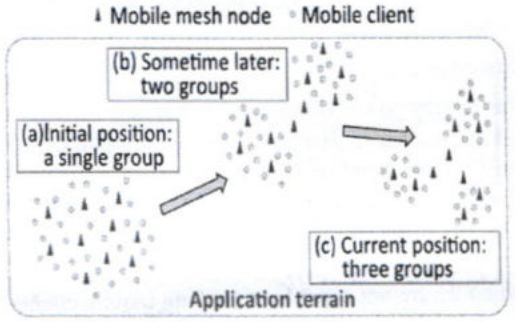


Fig. 1. Representation of Autonomous Mobile Mesh Network (AMMNET)

AMMNET contains mobile clients and mobile mesh node in one group. At the point when mobile clients begin moving mesh clients additionally move along with mobile clients (fig1a). The node of AMMNET part into groups (fig1b) with time and structures two are more intra-groups. The mesh nodes adjust system topology to shape integration between every single mobile client (fig1c) and make inter-groups.

Mobile clients in AMMNET suffer from overlapping channel [1] in communication. Missing of client node is the main problem arises in this type of network. The location of each mobile mesh node is given with a GPS and then the mesh node can find the location of mobile client within its sensing range. RFID [3] is another way for finding the location of nodes. If mobile mesh nodes are given with RFID reader to detect the mobile client. AODV [4] is a secured protocol which is used in MANET. Optimized AODV protocol [6] provides a secure routing of data in the dynamic wireless network, where multiple paths and multi-interface exists.

The mesh nodes in AMMNET will act as routes also hence in this paper mesh nodes are also referred as routers. Optimized Ad hoc On-Demand Distance Vector Protocol (AODV) routing protocol which is used in forwarding data in MANET is only used to transmit data in AMMNET.

II. EXISTING SYSTEMS

AMMNET is another class of network where mobile clients are strong against network partitioning. The mobile mesh nodes give the directing and hand-off of data to the mobile clients of AMMNET, by this mesh nodes, the mobile clients can impart. The mobile clients send data specifically to the mesh nodes. These mesh nodes are utilized as routers and transmits data to the destination.

The mesh nodes, acts as router as well as the primary employment of mesh nodes to track the mobile clients and discover its location. This makes the mesh nodes to deplete its battery power. In the event that mesh node falls flat its can be supplanted by new one and the mesh network will perceive and reconfigure new mesh node consequently.

On the off chance that the mobile clients in application terrine increments with time however number of mesh nodes won't expand, it shapes overhead on the mesh nodes to track all the mobile clients. In the event that the mobile clients vanishes then the mesh nodes has no capacity to pursuit the missing mobile client. The AMMNET as number of mobile nodes, while move of data they experience the ill effects of covering of channels.

Disadvantages

- Drains battery power of mesh node fast.
- Overhead is created at mesh node by continues tracing of mobile clients and routing data.
- Overlapping of channels.
- Number of mesh nodes will not increase with increase of mobile clients.
- Mesh nodes are not capable of missing mobile clients.

III. PROPOSED SYSTEM

AMMNET contains mobile clients and mesh nodes where mesh nodes are used for tracking of mobile clients and forwarding data for mobile clients. The mesh nodes are over headed by both tracking the location of mobile clients within its bandwidth range and transmitting or routing of mobile clients data to the destination in the network.

An Optimized AODV protocol is proposed in this paper, which is a secure and enhanced AODV protocol. Optimized AODV protocol is the one which provide the mobile clients to route the data by themselves with in the Intragroup, and make mesh nodes only to locate the mobile clients. With the help of optimized AODV protocol multi target routing is also done.

By providing the mobile clients with Optimized AODV protocol overhead of the mesh nodes is reduced which also helps mesh nodes to look after mobile clients efficiently. Since mobile clients are also taking part of routing inside group the battery of mesh node is saved which earlier was used in routing of data in Intragroup.

Advantages

- Achieves performance superior to existing protocols in terms of energy efficiency.
- Reduces replacement of mesh nodes.
- The mobile mesh nodes adapt their topology accordingly to archive full connectivity for all the mesh clients.
- A mobile client tracking solution to deal with the dynamic nature of client mobility.
- An AMMNET tries to prevent network partitioning to ensure connectivity for all its users. This property makes AMMNET a highly robust MANET.
- Reduce overhead of mesh node.
- Minimizes delay and increases through put.
- Minimizes power consumption in mesh nodes.

IV. SYSTEM DESIGN

An AMMNET is a mesh-based infrastructure that advances information for mobile clients. A client node can join with any adjacent mesh node, which helps transfer information to the destination mesh node by means of multihop sending. Like stationary remote mesh systems, where routers are conveyed in settled areas, routers in an AMMNET can forward information for mobile clients along the steering ways manufactured by any current impromptu directing conventions, for instance, AODV. Dissimilar to stationary remote mesh systems, where routers are sent at altered areas, routers in an AMMNET are mobile stages with self-governing development ability. They are furnished with situating gadgets, for example, GPS, to give navigational support while following mobile clients.

Clients are not needed to know their areas, and just need to occasionally send Becon messages. When mesh nodes get the Becon messages, they can distinguish the clients inside its transmission range. With this capacity, mesh nodes can constantly screen the portability of the clients, and move with them to give them consistent network. Mesh nodes can trade data, for example, their areas and the rundown of recognized clients, with their neighboring mesh nodes.

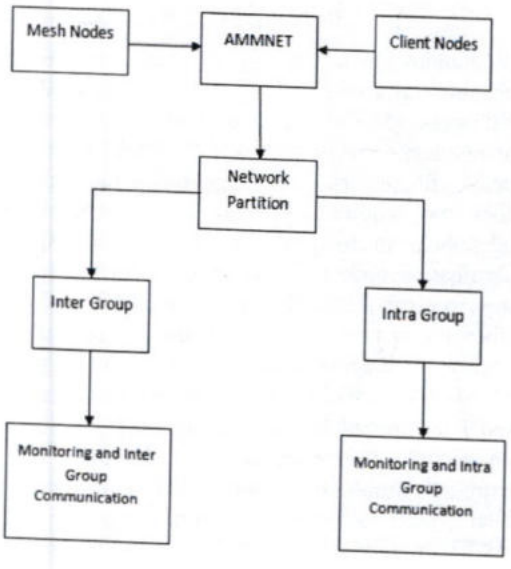


Fig. 2. System Architecture

The mobile clients stats moving and undergo network partition. The mesh node follows the mobile client and form groups of clients. The mesh nodes act as inter-router and intra-router to make all mobile clients to communicate with

them. After formation of groups mesh nodes are divided into three types according to the function it has been triggered.

- *Intragroup router*

If a mesh node has at least one mobile client within the radio frequency range of mesh node, which helps to route the clients data from one router to another router within the group is called intra-group router. Mesh node in Fig. 2 act as intra-group router.

- *Intergroup router*

If the mesh node is inside a group (Fig. 2) and helps to forward mobile clients data from its group to destination in other group then it is called as intra-group routers.

- *Free routers*

The mesh nodes without any mobile client within its range (Fig. 2) and helps to route data from inter-group router to other inter-group router is called free router.

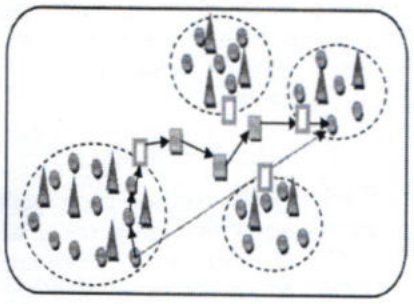


Fig. 3. Functions of mesh nodes

A. Mobile Client Tracking

At first all the mobile clients send Becon message to the mesh node inside its range. The mesh node check the clients rundown to discover the mobile client from which it got message and in the event that it is not present, solicitation to neighboring mesh nodes for client rundown. On the off chance that mobile client is show in between gathering then switch and distinguish the node. On the off chance that the mobile node is new then mesh node adds the node to its rundown and take after the new mobile clients of that gathering.

Algorithm 1: Mobile tracking algorithm

Step1: Send Becon message to mesh node within the range.
Step2: In intra-group request client list from neighboring mesh node and all are covered by neighbors.
Step3: In inter-group, retrieve location of router and identify.
Step4: If free, navigate to inter-group and request router to follow the new intra-group member (mobile client)

B. Topology Adoption Locally

A star topology of the local routers is made by changing over intra-group switch to inter-group routers, of which other group inter-group switch is in its range. At that point all neighbor inter-group routers are processed to star topology and bridge network is assembling to interface bridge network. The routers are activated to embrace new topology and after that free routers are recovered to add to the new topology.

Algorithm 2: local topology construction

Step1: Compute single star topology model.
Step 2: Build bridge network connecting all neighbors.
Step 3: Trigger router to adopt new topology.
Step 4: Reclaim free router to topology.
Step 5: End

C. Topology Adoption Globally

After development of local topology, a star topology ought to be joined between free routers, which there are no mobile clients in its range and activated as free routers. A message is telecasted to all the routers to gather routers area data to embrace global topology such that all groups are inter joined by bridge network. In the event that there are free routers exhibit a subset is shaped and free routers are sent. Another subset of inter-group routers is associated with free routers and a global star topology is built.

Algorithm 3: global topology construction

Step1: Broadcast a message to all bridge routers to collect information and coordinate global adoption.
Step 2: If free router, deploy a subset of inter-group router.
Step 3: Free routers deploy a subnet of router.
Step 4: If router at inter-group are more, adopt free subnet of router to connect to inter-group routers.
Step 5: Send Becon messages to router and collect information and repeat.

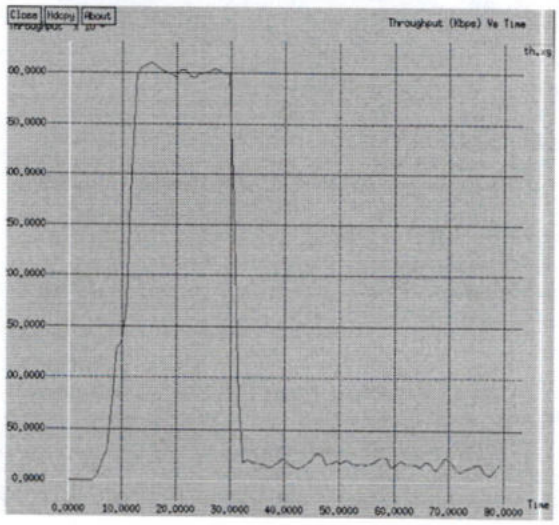
D. Routing in Intragroup

With the help of optimized AODV protocol the data from a mobile client is routed to destination which is inside a same group then mesh nodes are not used. The mobile clients are only used to find the route by broadcasting the path request to neighboring mobile clients. Many paths are formed but a path with less hops are selected and a multi destination is also achieved by a single path where more than one client shares the bandwidth and transmits message at a time.

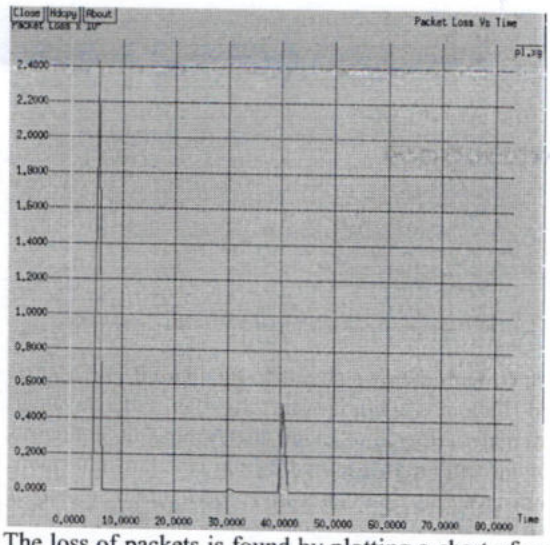
E. Routing in Intergroup

If the mobile client needs to transmit data to the destination placed out of the group then intergroup routing is done. Here the mesh nodes which are acting as intergroup router will find the route to the group where the destination is with the help of free routers as intermediate nodes and transmit data to that group.

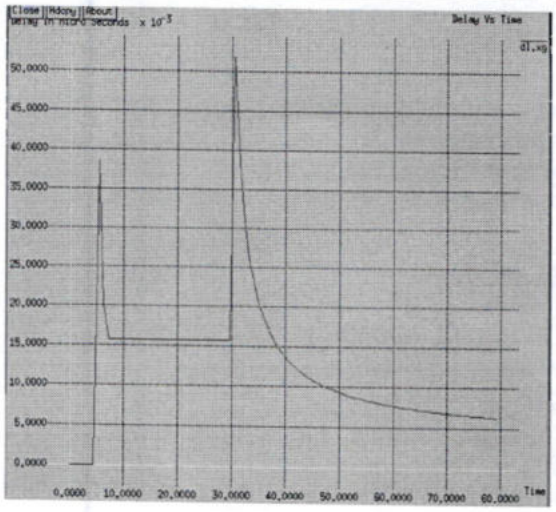
V. RESULT



To discover throughput of the data forwarding of the mobile clients in the network an xgraph is plotted by taking throughput in Kbps versus time. At the point when the mobile clients transmit data in a gathering without moving to another groups the through put is most extreme, however in the event that mobile clients changes bunch the throughput will lessen by little sum.



The loss of packets is found by plotting a chart of parcel loss at y axis and time at x axis. At the time of topology adaption and reproduction the mesh nodes are over headed and packet loss will be more. At the time of no over head there is a base or no packet loss is happened.



By taking delay of packet as consideration there is a delay at the time of group management and at normal transition. Delay of packets can be seen by plotting graph by taking delay at y axis and time at y axis.

VI. CONCLUSION

An arrangement of mobile nodes will convey in application terrine without experiencing network partitioning with the assistance of mesh nodes by shaping inter-groups and intra-groups. The appropriation of network topology with presentation of new nodes is progressively done in AMMNET. The Optimized AODV protocol helps in routing of data by mobile nodes in Intragroup and reduces overhead at the mesh nodes. But the problem of missing client still exists because if the mobile client goes away from the application area mesh nodes cannot locate them.

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3.3.4

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Quantitative Insights into the Crystal Structures of Nitro Derivatives of Ethyl (2E)-2-cyano-3-phenylprop-2-enoate: Inputs from X-Ray Diffraction, DFT Calculations and Hirshfeld Surface Analysis

UGC

Dhananjay Dey, Venugopal Prakash, Deepak Chopra, Vasu & Madnimaraiah Srinivas

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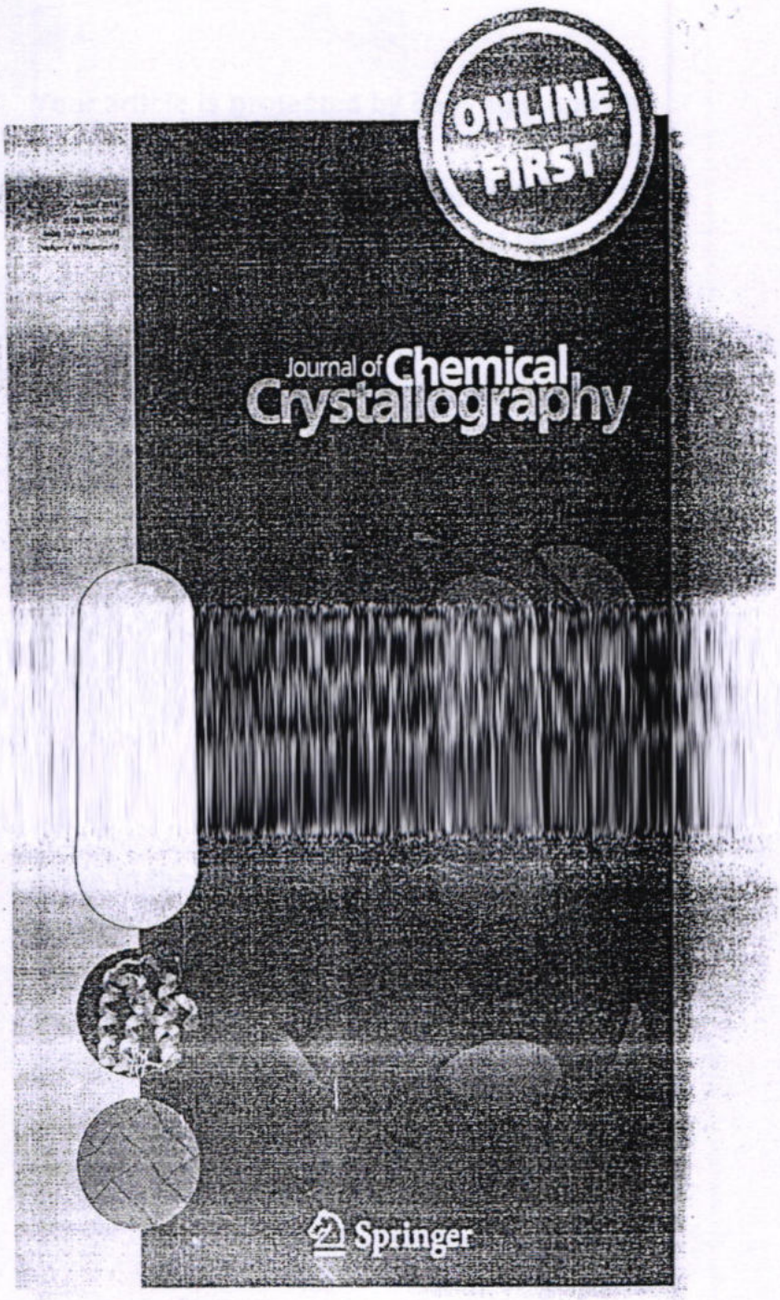

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Automated Method for Cancer Pinpoint Using Magnetic Resonance Imaging - A Theoretical Study

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ABSTRACT: A Partially Automated method for (Prostate) Cancer pinpoint using Multi-parametric magnetic resonance imaging has been proposed in this paper, which can be used in guiding surgery. A Random Walker (RW) algorithm has been analyzed with seed initialization to perform (Prostate) cancer pinpoint using Magnetic Resonance Imaging (MRI). Segmentation can be done by using Random Walker (RW) algorithm which has to be considered to be a fastest method. Random Walker (RW) method can be used with multi-parametric magnetic resonance imaging (MRI) and then by using Support Vector Machine (SVM) method, we can determine the seed points in a partially automated manner. By using this method, more weights to the image can be assigned in order to produce improved segmentation process. The proposed method can also give high specificity rate without reducing the sensitivity which is better than earlier methods and fisher sign test can be also used to find the statistical differences.

KEYWORDS: Support Vector Machine, Random Walker, Magnetic Prediction, Magnetic Resonance.

I. INTRODUCTION

A (Prostate) cancer develops in a gland i.e. male reproductive system. It is one of the typical cancers which spreads in other parts of the human body especially bones and lymph nodes. Pain while urinating, sexual intercourse and erectile dysfunction are some of the symptoms of this cancer. Initial treatment is more important which the prostate specific antigen testing increases cancer detection, but does not decreases mortality [3], [10].

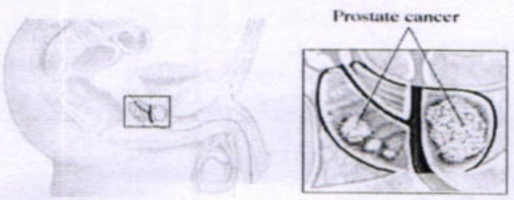

Fig-1: Prostate Cancer in human body

1.1 Prostate Imaging

The imaging methods used for (Prostate) cancer detection are Ultrasound (US) and Magnetic Resonance Imaging (MRI). The main drawback of Ultrasound (US) technique is poor tissue resolution, which cannot be used clinically. But compared to Ultrasound (US), MRI (Good Soft tissue Resolution) uses magnetic fields to locate and characterize (prostate) cancer [7], [19]. Multi-parametric prostate Magnetic Resonance Imaging (MRI) consists of 4 types which are follows:

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1. Weighed Imaging (WI).
2. Diffusion Weighed Imaging (DWI).
3. Magnetic Resonance Spectroscopic Imaging (MRSI).
4. Dynamic Construct Enhanced Imaging (DCEI).

II. LITERATURE SURVEY

Accurate Automatic Analysis of Cardiac Cine images

In this automated approach, they are 3 steps for analyzing the thickness and thickening of the images. First step is to segment then inner and outer wall tissue borders by using the geometric deformable model. In Second step, using Laplace equation, point-to-point correspondence between inner and outer borders of the tissue was found. In last step, Gauss Markov Random Field (GGMRF) model is used to reduce the errors. In this approach, the segmentation is based upon the ROC (Receiver Operating Characteristic) and DSC (Dice similarity Coefficients for higher accuracy [12] – [25].

III. EXISTING METHOD & DRAWBACKS

In earlier method, manual and fully (i.e. supervised and unsupervised) segmentation had been performed using multi-parametric MRI. By using semi-supervised cancer pinpoint, labeling of data requires laborious human annotation. According to Tiwari et al., representation of individual data is combined multi-kernel which is followed by semi-supervised dimensionally reduction, incorporated to a high dimensional data in a reduced space.

3.1 Drawbacks of Existing system

In previous method, Weighed and Apparent diffusion coefficient method is used instead of Random Walker (RW) and Support Vector Machine (SVM) method for prostate cancer localization [Artan et al.]. Manual seeds are initialized rather than all the multi-parametric images.

IV. PROPOSED METHOD & ADVANTAGES

In the proposed method, Random Walker (RW) technique can be used for image segmentation which is used in multi-parametric images. This method combines multiple image segmentation [Wattaya et al.] results in which each can be obtained by using Random Walker (RW) algorithm after varying the number of user assigned seeds. Then it is compared with Locality preserving projections (LPP) method of [Grady et al.] and [Levin et.al] for edge weights by applying linear transformation to RGB color.

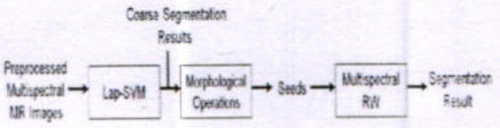

Fig- 2: Segmentation Process

4.1 Advantages of Proposed Method:

- To identify (Prostate) cancer pinpoint with multi-parametric MRI.
- Automated Seed initialization for RW algorithm.
- Several MR image types are combined optimally and automate the seed generation process for RW algorithm using discriminative learning techniques.

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4.2 Algorithm

Step1: Laplacian-Support Vector Machine (Lap-SVM) is used to produce a rough estimate on tumor locations for a given a set of multi-parametric MR images.
Step 2: Isolated pixels are removed from Lap-SVM (Laplacian-Support Vector Machine) output, and eccentricity values are determined for each of the connected components in the resulting binary image
Step 3: Applying erosion operation on the binary image.
Step 4: Assigning a positive seed at the center of the remaining connected component(s) and a negative seed to the location corresponding to the minimum Lap-SVM (Laplacian-Support Vector Machine) value in the unthresholded Lap-SVM (Laplacian-Support Vector Machine) output.

V. ARCHITECTURE

In previous work, segmentation method is designed by combining conditional random fields (CRF) with a cost-sensitive SVM, which allowed incorporating spatial information in the segmentation process. Incorporation of spatial information is achieved through seed points that are selected via SVM (Support Vector Machine) in the proposed method. These seed points allow us to accurately localize desired regions, higher specificity and sensitivity rates compared to (seeded) spatial algorithm in our segmentation scheme.

List of Modules:-

1. *Normalization*
2. *Anisotropic Filtering*
3. *Multi-parametric RW*
4. *Seed Generation using Laplacian SVM*

5.1 Normalization

Multi-parametric MRI dataset can be used, which can consist of three different types of MR images. Each multi-parametric component represents a particular anatomical and functional response of the prostate gland. Feature vectors used in our segmentation framework are the intensity values of the multi-parametric MR images. The prostate consists of various zones such as CG (Central Gland) and PZ (Peripheral Zone). PZ (Peripheral Zone) region is located at the back of the prostate gland, which is close to the rectum [23- 27].

Fig-3: Normalization process

For each of the multi-parametric images, PZ (Peripheral Zone) region intensities were normalized such that intensities in the PZ (Peripheral Zone) region had zero mean and unit standard deviation for all the training and testing subjects for a particular multi-parametric image type. This process brings intensities of different types of MR (Magnetic Resonance) images within the same dynamic range, improving the segmentation methods [5], [10], [11].

5.2 Anisotropic Filtering

Magnetic resonance images are typically corrupted by thermal noise due to receiver coils. Therefore, many earlier studies proposed various filtering schemes to remove noise before doing any further processing on them [30]. However, while suppressing the noise, we want to simultaneously preserve the information-bearing structures such as edge boundaries. Anisotropic filtering allows us to smooth PZ (Peripheral Zone) regions of multi-parametric images without blurring the tumor nodule edges. The diffusion equation for an image u is given by,

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$$\frac{\partial u}{\partial t} = \operatorname{div}(\rho(|\nabla u|) \cdot |\nabla u) \tag{1}$$

Equation encourages smoothing within PZ (Peripheral Zone) region while preserving tumor boundaries. This method will not cause interregional blurring as often caused by traditional smoothing techniques. Note that anisotropic filtering needs to be applied on the median-filtered and normalized images for a successful application as noted in our earlier study [25-29].

5.3 Multi-Parametric RW

RW (Random Walker) algorithm is a seeded segmentation technique that formulates the classical segmentation problem in terms of a discrete combinatorial problem. An edge connecting two vertices is denoted as ***eij***. A weighted graph has a value assigned to each edge called a weight denoted by ***wij*** . In the original RW formulation and used the typical Gaussian weighting function given by,

$$w_{ij} = \exp(-\beta\,(g_i - g_j)^2) \tag{2}$$

Where, ***gi*** indicates the image intensity at pixel ***i,*** and the value of the scalar is selected based on experience. Linear weighted combination of features yields a final image that yields improved RW (Random Walker) segmentation for the given set of seeds. Edge weights for the multi-parametric problem ***wij*** can now be written as,

$$w_{ij} = \exp\left\{-\beta\left(\sum_{n=1}^{N} k_n(g_{ni} - g_{nj})\right)^2\right\}. \tag{3}$$

5.4 Seed Generation Using Laplacian SVM

In this algorithm, the Seeds are manually initialized. Therefore, we have compared various methods, namely, support vector machines (SVM), transductive support vector machines (TSVM) and Laplacian support vector machines (Lap-SVM), to develop a seed selection technique most suited for (prostate) cancer pinpoint. SVM (Support Vector Machine) method is used only for seed generation for the RW algorithm, not the actual segmentation [15]. The geometry of data is modeled as a

graph in which nodes represents the labeled and unlabeled samples connected by weights ***wij*** resulting,

$$\|f\|_M^2 = \frac{1}{(l+u)^2}\sum_{i,j=1}^{l+u} w_{ij}(f(\mathbf{x}_i) - f(\mathbf{x}_j))^2 \tag{4}$$

VI. CONCLUSIONS

We presented a framework for automatically localizing prostate cancer with multi-parametric MR images using a new approach of partially supervised segmentation in this paper. Proposed Random Walker [RW] method produce improved segmentation results by assigning more weights to the images. Our study show that significantly improved segmentation results could be obtained with the proposed method compared to earlier developed methods. Fisher's sign test can be also used to show improvements with our method are statistically significant. Multiple initializations for the

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optimum values increases the computation cost slightly, and decreasing this computation is a subject of our future study.

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Factorial design application for the Protection of mild steel from corrosive medium using Castor seed oil as inhibitor

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Abstract: A polynomial equation is developed to relate the concentration of hydrochloric acid as corrosive medium for mild steel to the variables like inhibitor concentration, temperature and time. The inhibitor used is castor seed oil. The effect of variables has been investigated and these are optimized using 3 level full factorial design method. The model allows the prediction of the extent of corrosion inhibition at different conditions. ANOVA is used to evaluate the validity of model. The correlation coefficient between the calculated and the experimental data indicates good performance of the model. From ANOVA, the variables and their interaction effect on the corrosion rate were significant. A maximum of 84.1% of Inhibition efficiency was achieved under the optimum conditions of 50 %v/v inhibitors concentration, 48 hours time and at 303K temperature.
Key words: Mathematical model; Factorial design; corrosion of mild steel; castor seed oil.

Introduction

Castor oil is a vegetable oil extracted from the castor plant its Scientific Name is *Ricinus communis* L. and familyis Euphorbiaceae (Spurge). Castor oil a colourless to pale yellow with mild or no odour or taste has a wide range of uses. It is commonly used as a laxative and for the induction of labor. In the food industry it is used as food additives. In medicine, its derivative is used for skin problem and for skin conditioning. Castor oil is an effective motor lubricant. The presence of OH groups in all the fatty acid chains makes the oil unusually polar. It is because of this hydroxyl groups only that castor oil becomes valuable as chemical feedstock. It is a monosaturated fatty acid in which about 90% of fatty acid chains are ricinoleic acid, remaining is oleic acid, linoleic acid, stearic acid and palmitic acid. Its boiling point is found to be 313 $^0C^1$. Since castor oil has high percentage of fatty acid and the presence of ricin & ricinoleic acid, castor oil could be used as inhibitor in 2M HCl solution. The oil formed a thin film on the surface of the metal (Fe) due to adsorption obeying Langmuir adsorption isotherm. It offers large surface coverage due to long chain hydrocarbons. In this work, castor seed oil gas been used to study the corrosion inhibition of mild steel in acid medium. A full factorial design is used for the experiments and a polynomial equation is developed to relate the inhibition efficiency to the variables such as inhibitor concentration, time and temperature. The validity of the model is evaluated by the analysis of variance (ANOVA).

Experimental:

Castor seeds were obtained from local area .The seeds were cleaned and sun dried to a moisture content of 10 %, a level considered safe for long term storage. About 1 kg seeds were dehulled and used for the experiments. 250 gram sample seed kernels were cleaned and then coarsely minced at low speed in a blender

for 10 seconds[4]. The condenser with soxhlet extractor was preheated to 80 ^{0}C with round bottom flask was fixed and then heated to 70 ^{0}C (temperature slightly higher than the boiling temperature of the solvent n- hexane). The seed samples were placed with 250 ml of n-hexane in the round bottom flasks, and extracted for 8 hr. The oil was extracted and solvent was separated under vaccum. Separated oil was dried over anhydrous sodium sulphate.

Physicochemical analysis of the seed oil for iodine value, acid value, saponification value, viscosity, flashpoint, specific gravity, refractive index and free acid value has been performed according to the standard methods is shown in table -1. Removal of color and oxidizing bodies, residual gums, soap and trace metals by mixing oil with special adsorbents activated clay and heated to about 100 ^{0}C. The adsorbents containing impurities and oxidation product are removed and then filtered.

Table-1: Physicochemical analysis of Castor seed oil

Sl. No.	Parameter	Castor seed oil
1	Refractive index	0.9102
2	Viscosity (st)	5.9
3	Iodine Index	118
4	Ash content %	2.5
5	Acid Index(mg KOH/g)	2.4
6	Saponification value	179
7	Flash Point (C)	179
8	Fatty acid value (as Oleic) mg. KOH/g oil	0.99

Weight loss method

All corrosion inhibition data were obtained through weight loss experiments based on mild steel of surface area 5x1cm^2 with elemental composition of, C (0.043%), Mn (0.338%), Si (0.031%), P(0.041%) ,S (0.023%), Cr(0.047%), Mo (0.016%), Ni (0.019%) and Fe (99.437%). The blank solution was 2M Hydrochloric acid. From the stock solution of the extract, different concentrations of the inhibitor test solutions ranging from 5% to 50 % v/v were prepared. The steel specimens were cleaned with acetone, washed with water, dried and weighed to 0.0001 g precision. Two results were averaged for each inhibitor. The specimens were immersed in acid solutions containing various concentrations of the inhibitor for 24 hours and 48 hours at 303 and 313 K. The specimens were removed washed with water and dried. The mass of the specimens before and after immersion was determined using an electronic digital balance[2].

Factorial design: The experiments were conducted as per standards to investigate the given parameters affecting significantly the corrosion rate and also the independently controllable predominant process parameters. The parameters considered for the investigation are temperature, concentration and time[3]. Two levels of each of the three factors were used for the statistical analysis. The treatment combinations for the two levels and three factors are tabulated in Table-2.

Table -2: Factorial design of the corrosion process showing treatment combination

Variables	Actual value		Coded value	
	Low level	High level	Low level	High level
Inhibitor (%v/v) (A)	10	50	-1	+1
Time (Minutes) (B)	12	48	-1	+1
Temperature 0C (C)	303	311	-1	+1

The factorial design describes which factor shows more impact and influences the variation of one factor on the other factors. A full factorial design with three variables [Amount of inhibitor % v/v, Reaction time (minutes) and temperature (k)] is shown in the table-3. The optimum values of the variables were calculated with MINITAB 16.

To calculate the main effect we average the responses for the variable at high level and subtract the response at the low level .This will be equivalent to multiplying the response (% IE) by coefficients column for the variable (A,B,C) and dividing by half the number of experiments as shown in table-3. The main effect gives the relative importance of each variable. Numerically largest effect is for inhibitor concentration (variable A),

followed by time (variable B) and temperature (variable C). A positive effect means the response is higher at the higher range of variable.

Table- 3: Statistical parameter design and Main effects to determine the significance of response for the given variable

A	B	C	% I.E	A	B	C
1	-1	-1	65.00	50	-12	-30
1	1	1	41.76	50	48	38
-1	1	-1	45.67	-5	48	-30
-1	1	1	36.33	-5	48	38
1	1	-1	83	50	48	-30
1	-1	1	47.34	50	-12	38
-1	-1	-1	32.33	-5	-12	-30
-1	-1	1	29	-5	-12	38
Main Effects :				45	36	8

A mathematical expression to describe the design matrix combination mentioned in Table (2) as low and high level of each factor and its corresponding corrosion rates mentioned in Table (3) in code :corrosion Rate = f (A,B,C) Where A is inhibitor concentration, B is the time and C is the temperature. The above model includes the effects of main variables first order and second order interactions of all variables. Therefore the general model equation is given as:

Corrosion Rate = β0 + β1*A + β2*B + β3*C + β4*AB + β5*BC + β6*CA + β7 *ABC

Where β0 is the average response of corrosion Rate and β1, β2 β3, β4, β5, β6 and β7 are coefficients associated with each variables A,B ,C and interactions. The regression coefficients and the associated affects are shown in tables-4. The significant factors are identified by analysis of variance technique[5]. Based on the experimental results, a multiple linear regression model is developed and the effect of 95 % confidence levels for the extract was presented in the table 4. A regression thus generated establishes correlation between the significant terms obtained from ANOVA, namely temp, inhibitor and time on the corrosion rate were statistically significant. Substituting the coded values of the variables for any experimental conditions in the above equation the corrosion rate vales for the corrosion control behavior of the mild steel can be calculated. The developed model equation is expressed as

Corrosion Rate = 47.54 +11.13 A +4.136B -8.946 C – 1.031AB - 5.779 BC -3.699 AC -1.196*ABC

The above equation has been used to predict the corrosion rate of the mild steel. The results of the linear regression model table -4 for castor oil showed that the inhibitor is the most important variable with the main effect of +11.13 mpy followed by temperature (C) with -8.946 mpy and time B with +4.136 mpy. The regression revealed that temperature negatively impacted the inhibition efficiency of castor seed oil on mild steel. The effect of inhibitor concentration was most pronounced as seen from the value of coefficient of that variable in comparison with the other. It can be concluded that when the effect of a factor is positive an increase in the value of the inhibition efficiency is observed when the factor changes from low to high level. In contrast, if the effect is negative, a reduction in inhibition efficiency occurs for high level of same factor.

Table-4: Statistical parameters for 2^3 design

Factor	Degree of freedom	Coefficient	Effect
Average		47.54	
Inhibitor Concentration	1	11.136	23.442
Time	1	4.136	8.273
Temperature	1	-8.946	-17.893
Inhibitor concentration	1	-1.031	-2.063
Inhibitor concentration * Time * Temperature	1	-5.779	-11.558
Time * Temperature	1	-3.699	7.397
Inhibitor concentration * Temperature * time	1	-1.196	-4.392

Analysis of variance

The results of ANOVA are presented in the table-5. The analysis was evaluated for a confidence level of 95 % that is for significance level of $F_{0.05,1,7}$=5.59,all effects presenting F higher than 5.59 have statistical insignificance. The F –value for all models was less than 0.05, and then the parameter or interaction can be considered as statistically significant. From the table-6 it is observed that the temperature (C),inhibitor (A) and time (B) are significant model terms influencing corrosion rate of mild steel, since they have obtained F- value less than 0.05. Although the interaction effect of temperature with inhibitor (AC) was considered statistically insignificant since their F- values are greater than 0.05, and hence it is neglected. From the P values, it appears that the main effect of each factor and the interaction effects are statistically significant when p is less than one. Therefore the two ways interaction time and temperature is statistically insignificant.

Table- 5: Analysis of variance-full fitting model for Castor seed oil

Factor	Sum of	Degree of	Mean	F value	P –value
Inhibitor concentration	1099.10	freedom	1099.10	3.90	0.120
Time	136.87	1	177.379	0.57	0.492
Temperature	640.28	1	728.284	2.34	0.201
Interactions					
Inhibitor concentration *Time	8.51	1	2.344	0.01	0.928
Inhibitor concentration	267.15	1	231.08	0.12	0.750
Time * temperature	38.59	1	38.59	7.23	
Residual	0.00	2	311.200		
Total	1995.95	7			

Multiple R =0.903206 , R-Sq = 0.815781, R-Sq(adj) =0.67717 and Standard Error= 10.29191

The various parameters chosen for the confirmation test are shown in the table -6. The results of the confirmation tests were obtained and comparisons were made between the actual corrosion rate values and predicted values[6-8]. The model predicts much more increase in inhibition efficiency with high and low levels of inhibitor concentration, time and temperature.

Table-6: Comparison of the Actual with the predicted result for mild steel using Castor seed oil in 2 M hydrochloric acid.

Sl. No.	Inhibitor concentration	Time (min)	Temperature (k)	Inhibition Efficiency (%)	Predicted	Residuals
	1	-	-	65	64.085	0.915
	1	1	1	41.76	54.465	12.705
	1	1	-	45.67	48.915	3.245
	1	1	1	36.33	31.0225	5.3075
	1	1	-	83	72.3575	10.6425
	1	-	1	47.34	46.1925	1.1475
	1	-	-	32.33	40.6425	8.3125
	-1	-1	1	29	22.75	6.25
8						

The inhibition efficiency decreases with increase in temperature shown in table-7. The maximum inhibition efficiency is lower at 311K than at 303 K. This is due to the dependence of adsorption on temperature. As the temperature rises, the quantity adsorbed decreases and as a result, the isotherm of higher temperatures is below the isotherm of lower ones. The decrease in inhibition efficiency with increasing temperature may be due to weak adsorption interaction which is physical in nature. The values of the rate constant was calculated using the first order rate law, $k = (2.303/t) \log ([A_0/A])$, where $[A_0]$ is the initial mass of the metal and [A] is the mass corresponding to time't'. The half-life ($t_{1/2}$) was calculated using the relationship , $t_{1/2}$ =0.693/ k. The values of rate constant and half-life obtained from the above relations were summarized in Table-7. Half life values were found to be constant at different concentration level.

Table-7: The values of rate constant and half-life for the corrosion inhibition of mild steel in castor seed oil

Concentra Tion, (% v/v)	Corrosion Rate (mpy)	Surface coverage (θ)	Rate constant (k/s)	Half life(s)	Corrosion Rate (Mpy)	Surface coverage (θ)	Rate constant (k/s)	Half life (s)
Temperature 303 k and Time 12 hours, 2M HCl					**Temperature 303 k and Time 48 hours, 2 M HCl**			
Blank	27212.33				27212.33			
5	18368.32	0.325	0.0098	70.41	14694.66	0.46	0.0069	99.66
10	17143.77	0.37	0.0086	80.16	14150.41	0.48	0.0066	103.99
15	16599.52	0.39	0.0082	84.49	12653.73	0.535	0.0059	115.91
20	16599.52	0.423	0.0076	91.64	12653.73	0.567	0.0056	122.84
25	15701.51	0.436	0.0073	94.46	11782.94	0.589	0.0054	127.61
30	14041.56	0.484	0.0066	104.86	10912.14	0.599	0.0053	129.77
35	13225.19	0.514	0.0062	111.36	9714.801	0.643	0.0049	139.31
40	11891.79	0.563	0.0057	121.98	8245.335	0.697	0.0046	151.01
45	10694.44	0.607	0.0052	131.51	6286.048	0.769	0.0041	166.61
50	9524.315	0.65	0.0049	140.83	4353.972	0.84	0.0038	181.99

The effect of temperature was studied for the given concentration of inhibitor. G^0_{ads} is a thermodynamic property, which shows a strong correlation with the energy, volume and with the inhibition polarisability. Values of the free energy of adsorption (G^0_{ads}) at various temperatures were calculated using the following equation, $G^0_{ads} = - RT \ln (55.5K)$, Where K is equilibrium constant , = degree of coverage on the metal surface, T is the temperature in Kelvin, C is the concentration of the inhibitor and R is the gas constant. With the help of the temperature studies results, thermodynamic parameters such as the entropy of adsorption (ΔS^0) and enthalpy of adsorption (ΔH^0) can be calculated from the from the slope and intercept respectively. The G^0_{ads} values obtained indicate that adsorption of castor seed oil is spontaneous and follows physical adsorption mechanism. Generally if G^0_{ads} values are up to -20 kJ/mol there is consistence in electrostatic interaction between the charged metal and charged molecules, which signifies physical adsorption, while values more negative than -40 kJ/mol signify chemical adsorption. The values of H and S (table-8) infer that the adsorption of esters present in castor seed oil on mild steel is enthalpic and entropic controlled.

Table-8: Calculated values of G^0_{ads} H^0 and G^0 for the corrosion of mild steel in 2M Hydrochloric acid in various concentration of Castor seed oil

Temp. (K)	H^0	S^0	G^0_{ads} Inhibitor Concentration (% v/v)									
			5	10	15	20	25	30	35	40	45	50
303 K	-0.117	-8.555	-8.08	-9.72	-10.71	-11.39	-11.95	-12.38	-12.78	-13.16	-13.55	-13.94
311K	-0.147	-7.945	-7.76	-9.54	-10.59	-11.38	-11.99	-12.48	-13.00	-13.56	-14.31	-15.30

The isotherm models such as Langmuir and Freundlich were studied and described the equilibrium characteristics of adsorption. Assumptions of Langmuir relate the concentration of the adsorbate in the bulk of the electrolyte (C) to the degree of surface coverage (θ) according to equation :$C/(\theta) = 1/Qm\ b + C/Qm$, Where Qm and b are Langmuir constants related to sorption efficiency and energy of adsorption respectively. The linear plot of C/(θ) vs C suggest applicability of Langmuir isotherm. The values of Qm and b are calculated from slope and intercept of the plot and are listed in the table-9. From the results, it is clear that the value of adsorption efficiency Qm and adsorption energy increases on increasing the temperature. Freundlich isotherm represents repulsive interaction between adsorbed solute particles is based on heterogenous surface representing the binding sites which independent[9]. The logarithmic form of Freundlich equation is represented as $\log C/(\theta) = \log K_f + 1/n \log C$,Where (θ) is surface coverage and C is the concentration of castor seed oil (% v/v) , K_f and n are constants which integrate the factors affecting the adsorption capacity and intensity of adsorption, respectively. Linear plots of log C/(θ) versus log C shows that adsorption of castor seed oil obeys the

Freundlich isotherm[9]. The K_f and n values are given in table-9 indicating the spontaneity of adsorption. hence stability of adsorbed layer is higher at 303 K.

Table- 9: Langmuir and Freundlich isotherm results

Temperture in Kelvin	Langmuir Isotherm Results			Feundlich Isotherm results		
	Statistical constants			Statistical constants		
	R^2	Q_m	b	R^2	K_f	n
303	0.939	0.7412	0.081	0.938	5.358	1.416
311	0.938	0.903	0.098	0.938	3.5399	1.326

Conclusion

ANOVA results revealed that the parameters (A, B & C) are statistically significant with F-values less than 0.05 for the inhibitor. The interactions exhibited sufficient influence except for higher temperature and were statistically significant. The results obtained by regression equations closely correlate each other which validate the regression equations developed. A good agreement between the predicted and actual corrosion rate was observed. The developed mathematical models can be used to predict the corrosion values in terms of corrosion control process parameters obtained from any combinations within the ranges studied and also employed for optimization of the process parameters of mild steel with respect to corrosion control values. Experimental data showed that in the presence of different concentration (5 – 50% v/v), castor seed oil inhibited the corrosion of mild steel in acidic medium. The inhibition efficiency increased with increase in the inhibitor concentration and with decrease in temperature leading to a physical adsorption. The highest efficiency of 84.1 % was observed at the optimum of 50 % v/v for castor seed oil in the acid solution and the effect of immersion time of the inhibitor was attained at 48 hours and at the temperature of 303 Kelvin.

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Sl.No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISBN/ISSN number
1	Re-Engineering the Engineering	A. Poonguzhali	ECE	Asia Pacific Journal of Research ,VolumeIII,Issue-x	2013-14	ISSN-2320-5504
2	Business Process Re engineering and customer satisfaction in Indian Telecommunication sector	Manjula.S, Dr. Gangavathi P	Mathematics	Asia Pacific Journal of Research Oct 2013,Volume III, Issue X	2013-14	ISSN 2320-5504
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"Re-engineering of Indian Economy-Opportunities & Challenges" On 24th October 2013

RE ENGINEERING THE ENGINEERING

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Abstract:

Re engineering is the most important issue faced by industry . There are many challenges in the way of reengineering, so to overcome these problems some important dimensions are explored. There are many factors which identify the reengineering dimensions like environmental, size, economical, technical etc. In the present work an attempt has been made by review of literature to identify the dimensions and their parameters in the software Industry.

Keywords – ***Industry needs, pre hire training, collaborative research.***

1. INTRODUCTION

Industry has its own objective and education system has its own. Education means enlightenment but if someone is just able to write a sentence it does not mean that he is enlightened, it means one has to be able to analyse. Once we are educated we should contribute to the society, then only society will benefit, this is the objective of education. Industry focuses more on making profit and therefore they engage very less with the education institutions. Industry requires manpower and that comes from educational institutions, therefore it should get more and more involved in the process of education.

India is a logical choice of outsourcing for the world with 65% of the world's eminent companies and one of the world's largest pools of scientific and technical talent. India has proved its mettle in IT And BPO industries to global community. Indian IT/ BPO industries have witnessed phenomenal growth in recent years leading to tremendous increase in the demand of skilled manpower. In this direction of development, the government has allowed private sector to open engineering colleges across the country to fulfill the huge demand of trained professionals of the industries. And in a very short span of time, the number of private engineering colleges has vastly increased and today around 3000 colleges and university together are producing nearly a million engineers per year in India.

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Business Process Reengineering and Customer Satisfaction in Indian Telecommunication sector

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ABSTRACT

Intention of the study was to quantitatively analyze the factors based on which telecom service providers can formulate strategy to satisfy customers to get an edge over the competitors. And we will see how Business. Process Management and Re-engineering might play the role of a weapon to Indian Telco service providers. The elements of the business processes of the Telecom domain, which affect customer satisfaction level and how BPR can impact the level of customer satisfaction in the telecom sector in India was investigated in this study. Mainly three categories of research findings have been deduced from the study. The first category dealing with the customer's perception on different areas of Indian Telecom processes exposed the need for a fast cycle capability and competitiveness of the Telco system. The second category analyzes customer's satisfaction with the existing service facilities of Indian Telco services and shows an average figure of their present satisfaction level. The third category describes customer's perception on Indian telecom service providers for enhancement of the level of satisfaction revealing a strong need for strategic planning and implementation of IT-enabled reengineered business process. The findings will be useful to increase customer value, customer satisfaction and retention and can guide the strategic business planners to introduce better, innovative and customized products to the consumers.

Keywords: Business process reengineering, fast cycle capability, customer satisfaction, business process improvement.

Introduction

Business Process Reengineering, Customer Satisfaction and Consumer Behaviour etc. are relatively new subjects in the field of business process research in India. In the present business environment organizational success depends on out-performing the business competitors while satisfying the consumers. The telecom ecology of a country is an essential domain not only for the economic development but also having huge social impact. Living in an age of global transition, one can't help wondering about the transformations that took place, are taking place and will take place in social, economic and technological areas. Technological changes have been massive and radical in India with the utilization of voice and data transmission technologies by companies for their global business framework. The revolution is still on, particularly for Telecom sector in India, as India is already having more than 110 million global systems for mobile communications (GSM) subscribers, according to global mobile suppliers association (GSA). So, the orientation to such a huge volume of customer satisfaction is quite an obvious phenomenon. Many successful business people over the years have identified the importance of focusing on customer satisfaction. Thus, customer satisfaction has a long-reaching impact on the current and perhaps future viability of an organization. Schlesinger and Heskitt (1991) demonstrated the inter-relation between satisfied customers and satisfied employees in their 'cycle of good service' showing a cyclic relation which starts from customer satisfaction leading to lower customer churn which in turn generates higher profit margin. Satisfaction is quickly becoming the key to competitive posture within an industry as customer satisfaction has proved to give an organization competitive advantage by way of improved profitability, improved customer retention and improved market share. Most of the time a re-engineered system provides process automation of a business area by optimizing the sequence of activities and the involvement of proper human or computer resources associated with different steps.

This study was aimed with the following objectives

- To study the customers' perception on different dimensions of current business process of telecommunication in India.
- To develop an understanding about the degree of importance attached by the customers to each of these dimensions.
- To study how the applications of information technology in the business process of Telecom has affected customer satisfaction.
- To suggest a strategic framework through IT-enabled business process in Indian Telecommunication for enhancement of customer satisfaction.

This study has been carried out for available telecom service providers operating in and around Kolkata (A major metro city located in the eastern part of India).

Business Process Re-engineering:

Business Process Re-engineering or BPR is the analysis and redesign of workflow and processes within and between Organizations. It is the Fundamental rethinking and Radical redesign of Business Processes to achieve Dramatic improvements in critical measures of performance such as Cost, Quality, Service and Speed.

Business Process:

- BP is a collection of activities that takes one or more kinds of input and creates an output that is of value to customers

Materials and methods:

Experimental design:

This work was done mainly as an exploratory research to reveal the correlation between business process reengineering and customer satisfaction. It was planned to analyze the customer psyche i.e., to find out what were the customers' needs and expectations and their telecommunication experience with the service providers. Hence, they have many questions of customer.

Questionnaires were divided under several sections:

Section A: Products and services offered by the service providers where the customer is receiving his/her service.

Section B: Telecom operation or process for delivering the service where the customer is receiving the service.

Section C: Customer's perception of telecom services.

Section D: Customer's idea on process reengineering for better satisfaction.

Section E: Background of the respondent.

Approximately sets of different questionnaires were used.

Scaling technique:

We have used Likert-type Scales, consisting of a number of statements to scribe either a favourable or unfavourable perspective to a given object to which the respondent is asked to provide his/her input. Each response is assigned with a numerical value, indicating its favourableness / un-favourableness and the scores are summed up to measure the respondent's behaviour.

Sampling:

It was decided that the study would be carried out among telecom customers from different service providers in Kolkata region in West Bengal and its suburbs. This was done by the concept of convenience sampling. First, the 19 telecommunication service providers were arranged but the final selection was done with the help of the random sampling process. It was actually then trimmed down to 6 service providers. The whole geographic area in and around Kolkata was divided into two main parts as Kolkata main city area and suburb of Kolkata. One of the prime motives behind the research study was to get direct feedback/input from the end-customers based on the above-mentioned questionnaire. The customers were taken at random by the interviewer on the basis of judgmental process because the researcher realized that they have more useful information related to the research.

Statistical analysis:

The data collected through questionnaire were analyzed using the following statistical techniques:

- Univariate statistical technique: The measures of central tendency, namely, mean were used for determining customer satisfaction on various dimensions of Indian Telecom sector.
- Bi-variate statistical techniques: The correlation matrix of the variables has been used to determine the association amongst the variables.
- Multivariate statistical techniques: Factor analysis was carried out to identify the different dimensions of Indian Telecom industry and the variables that impact the dimensions.

Results and discussion

The data collected were analyzed and tested fewer than three categories:

1. Category I: Customer perception on different parameters of Indian Telecom customer-centric process.
2. Category II: Customer satisfaction on service facilities of Telecom services and

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Antibacterial Potential and Corrosion inhibition efficiency of Emblica officinalis (Amla)

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Abstract : Electrochemical corrosion behavior of mild steel has been investigated, in 1.5 M sulphuric acid and hydrochloric acid solutions containing Amla (Emblica officinalis) leaves aqueous extract as corrosion inhibitor. Experiments were performed by weight loss method for different time intervals and at room temperature. Inhibition efficiency was found to increase with increasing concentration of inhibitor (0.2 g /l to 10 g/l) for 6 hour at room temperature. The maximum inhibition efficiency of Emblica officinalis leaves was 52 % in 1N Sulphuric acid and 87 % in 1 N Hydrochloric acid respectively. From the comparative studies, it was investigated that the corrosion inhibition efficiency of Emblica officinalis leaves aqueous extract is greater in hydrochloric acid[1-3]. This may be due to the presence of wide variety of compounds like, tannins, alkaloids and phenols in Emblica officinalis plant. Also, antibacterial activity of Emblica officinalis with 20 mg.ml concentration was studied. In all bacterial strains *Escherichia. Coli* ATCC 632, *Salmonella typhi* ATCC 13311, *Pseudomonas aeruginosa* ATCC 13525, *Bacillus cereus* ATCC 128263 and *Bacillus subtilis* ATCC 128263 the zone of inhibition of test microorganisms was recorded as 7.97 ±0.71, 9.70±0.08, 6.77±0.19, 8.70±0.41 and 9.87±0.42 mm.

Keywords: Mild steel; Emblica officinalis leaves extract; Corrosive medium; weight loss method.

Introduction:

The research in field of corrosion inhibition has been addressed towards the goal of using cheap, effective biomasses at low environmental impact. Keeping these factors in mind, several naturally occurring compounds have been selected as corrosion Inhibitors in the different corrosive medium The selected inhibitor is non toxic utilized in food, cheap easily available and effective also. This paper describes the investigation of low toxic easily biodegradable plant Emblica officinalis antibacterial activity and corrosion inhibition efficiencies.

Emblica officinalis belongs to the family Euphorbiaceae possesses anti-viral, antibacterial, anti-cancer, anti-allergy, and anti-mutagenic properties. Amla is one of the most extensively studied plants and it contains tannins, alkaloids, and phenolic compounds. Amla is a rich source of vitamin C contents more than the levels of oranges, tangerines, or lemons[1]. The fruit also contains gallic acid, ellagic acid, chebulinic acid, chebulagic acid, emblicanin A, emblicanin B, punigluconin, pedunculagin, citric acid, ellagotannin, trigallayl glucose, pectin, 1-O- galloyl-b-D-glucose, 3,6-di-O-galloyl-D-glucose, chebulagic acid, corilagin, 1,6-di-O-galloyl-b-D-glucose, 3 ethylgallic acid (3 ethoxy 4,5 dihydroxy benzoic acid), and isostrictiniin[2]. It also contains flavonoids such as quercetin, kaempferol 3 O-a-L (600 methyl) rhamnopyrano- side and kaempferol 3 O-a-L (600 ethyl) rhamnopyranoside[9,10].

Experimental:

Aqueous extracts was prepared by mixing 10 gram of E. officinalis leaves powder in 100 ml of distiiled water, filtered. The filtrate was sterilized at 120 ^{0}C for 20 minutes and preserved until further use. Bacterial strains were maintained on tryptophone soy agar (TSA). The antimicrobial assay was performed by agar well diffusion method. A well was prepared in the plates with the help of a cork- borer (0.85 cm). 100 µl of the test compound was introduced in to the well. The inoculated plates were incubated at 35-37 °C for 24 hours and zone inhibition was measured to the nearest millimeter (mm). The bacteria selected for study were common human pathogens like *Escherichia. Coli* ATCC 632, *Salmonella typhi* ATCC 13311. *Pseudomonas aeruginosa* ATCC 13525, *Bacillus cereus* ATCC 128263 and *Bacillus subtilis* ATCC 128263[11].

Emblica officinalis leaves were washed with distilled water and dried in sunlight. Then it is powered with the help of a mixer. The resulting fine powder was stored in a sample bottle. Eight different concentrations (0.2, 0.4, 0.8, 1.6, 3.2, 6.0, 8.0 and 10.0 g/dm3) of the extract were prepared with 1N hydrochloric acid and 1 N sulphuric acid solutions and was used for all measurement. Mild steel metal (the percentage elemental composition was found to be, C(0.048%), Mn (0.335%), Si (0.029%), P(0.041%) ,S (0.025%), Cr (0.050%), Mo (0.016%), Ni (0.019%) and Fe (99.437%) having a surface area of 5x1cm^2 were cut from a large sheet. The specimens were polished successively with emery sheets, degreased and dried. Distilled water and AR grade H_2SO_4 and HCl were used for preparing solutions[4]. The specimens in triplicate were immersed in 1 N acids solution containing various concentrations of the inhibitor for six hours at 30 ^{0}C. The specimens were removed washed with water and dried. The mass of the specimens before and after immersion was determined using an electronic digital balance.

The metal surface was dipped in 1N acids solution, stirred without and with various concentrations of the inhibitor with various concentrations (0.2g/l to 10 g/l) for desired interval of time (6 hrs) at 30 ^{0}C. The dissolution rates (mpy) were calculated by estimating the amount of mild steel surface dissolved in corrosive medium. The average mass loss of the three replicate measurements was calculated. Inhibitor efficiency (I.E.), corrosion rate and surface coverage (θ) were calculated from the weight losses of the specimens in the absence and presence of the inhibitor using the equations[5,6].

The corrosion rate for room temperature with various concentrations of inhibitor and various concentrations of anions was obtained from the following formula,

$$C.R\ (mpy) = \frac{436.095 \times 1000 \times W}{A \times T}$$

Where, W = Weight loss in grams, A = Area of specimen in cm^2 , T = Exposure time in hours. The unit of the corrosion rate is in mills per year (mpy).

$$IE\% = \frac{[\text{Weight loss without inhibitor - weight loss with inhibitor}]}{\text{Weight loss without inhibitor}} x100$$

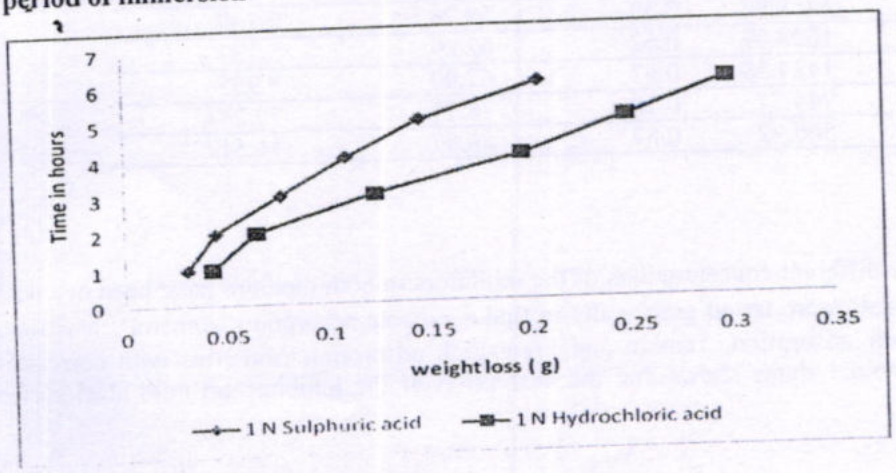
The corrosion rate was calculated by measuring the amount of mild steel dissolved in the solution analytically.

$$\text{Surfacecoverage } (\theta) = \frac{\text{Weightloss without inhibitor} - \text{weight loss withinhibitor}}{\text{weight loss without inhibitor}}$$

Result & Discussion:

The results of weight loss experiments of corrosion of mild steel in 1N HCl and 1 N H_2SO_4 in different intervals of time and at 30 ^{0}C temperature are shown in figure-1. Corrosion rate (IE) increases at the given temperature for all concentrations.

Figure-1 : weight loss measurement for mild steel in the given acids of 1 N concentration for the given period of immersion



The results of weight loss experiments of corrosion of mild steel in 1N HCl and 1 N Sulphuric acid in the presence of Emblica officinalis leaves extract at 30 ^{0}C temperature are shown in table-1 and table-2. The I.E increases at the given temperature for all concentrations. The inhibition of corrosion may be due to the formation and maintenance of a protective film on the metal surface.

Table-1: Corrosion Rate for mild steel in the given concentration of inhibitor with 1N H_2SO_4 solution for the period of 6 hours immersion

Inhibitor concentration (g/l)	weight loss (g) H_2SO_4	CR(mpy)	Surface coverage (θ)	Inhibition efficiency (%)	C/(θ)
Blank	0.204	2965.45	-	-	-
0.2	0.191	2776.47	0.06	6.37	3.138
0.4	0.186	2703.79	0.09	8.82	4.533
0.8	0.177	2572.96	0.13	13.24	6.044
1.6	0.162	2354.91	0.21	20.59	7.771
3.2	0.135	1962.43	0.34	33.82	9.461
6.0	0.121	1758.92	0.41	40.69	14.747
8.0	0.098	1424.58	0.52	51.96	15.397
10.0	0.098	1424.58	0.52	51.96	19.245

Table-2: Corrosion Rate for mild steel in the given concentration of inhibitor with 1N HCl solution for the period of 6 hours immersion

Inhibitor concentration	weight loss (g) HCl	CR(mpy)	Surface coverage (θ)	Inhibition efficiency (%)	C/(θ)
Blank	0.297	4317.34	-	-	-
0.2	0.254	3692.27	0.14	14.48	1.381
0.4	0.201	2921.84	0.32	32.32	1.238
0.8	0.165	2398.52	0.44	44.44	1.800
1.6	0.121	1758.92	0.59	59.26	2.700
3.2	0.112	1628.09	0.62	62.29	5.137
6.0	0.098	1424.58	0.67	67.00	8.955
8.0	0.065	944.87	0.78	78.11	10.241
10.0	0.039	566.92	0.87	86.87	11.512

The surface coverage values for different concentrations of the inhibitors in both medium have been evaluated from the weight loss data. The data were tested graphically to find a suitable adsorption isotherm[7]. It is found that the data fitted the Langmuir adsorption, Temkin and Freundlich adsorption isotherms with correlation coefficients of > 0.9. The sigmoidal shape shows that the adsorption of the inhibitor on mild steel surface follows Frumkin isotherm.

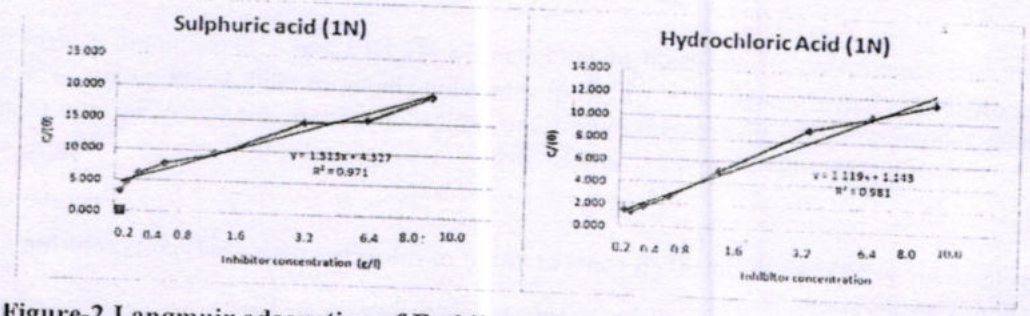


Figure-2 Langmuir adsorption of Emblica officinalis leaves extract in 1 N H_2SO_4 & 1N HCl

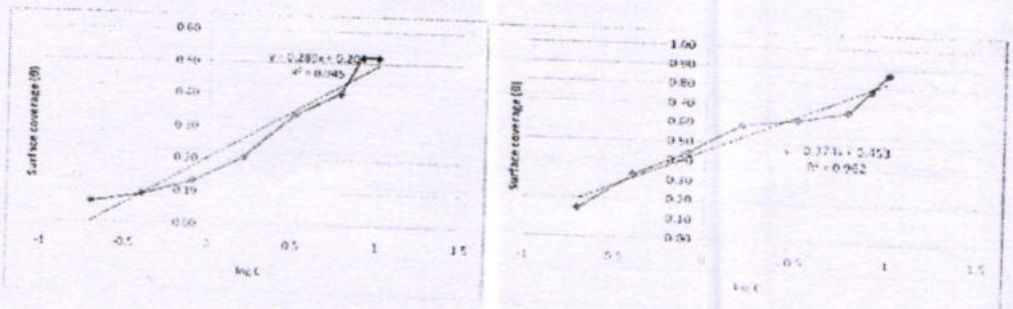


Figure-2 Tempkin adsorption of Emblica officinalis leaves extract in 1 N H_2SO_4 & 1N HCl

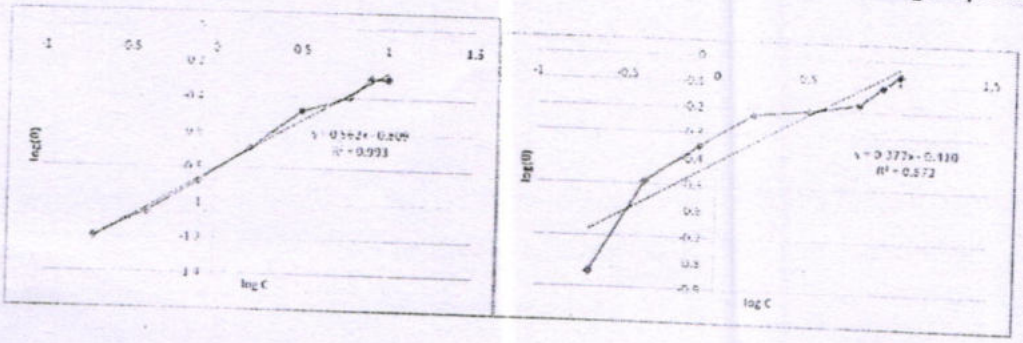


Figure-3 Freundlich adsorption Emblica officinalis leaves extract in 1 N H_2SO_4 & 1N HCl

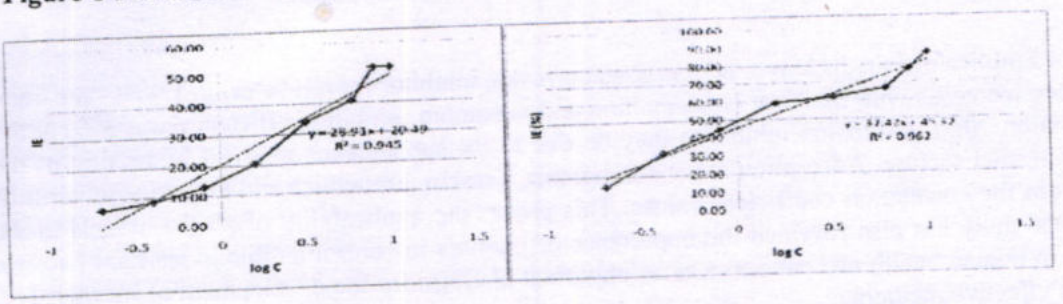


Figure-4 Frumkin's adsorption Emblica officinalis leaves extract in 1 N H_2SO_4 & 1N HCl

Calculated values of activation energy Ea ($kJmol^{-1}$), Rate constant k (s^{-1}) and Half life (s) for mild steel at 30 ^{0}C are recorded in table-3. These values indicate that the adsorption of Emblica officinalis leaves extract on the surface of mild steel is spontaneous and favoured the mechanism of physical adsorption[8].

Table 3. Calculated values of activation energy Ea ($kJmol^{-1}$) ,Rate constant ,k (s^{-1}) and Half life (s) for mild steel at 30 ^{0}C.

Inhibitor with corrosive media	slope	R^2	Ea	Rate constant	Half life $t_{1/2}$
H_2SO_4	0.642	0.972	9.001	0.00419	218.00
HCl	0.877	0.982	9.787	0.00196	633.23

Table-4 Antibacterial Potential of Embilica officinalis leaves aqueous decoction by Agar diffusion method

Sl. No	Bacterial strains	Zone of inhibition(mm)*			
		Trial-1	Trial-2	Trial-3	Average †
1	*Escherichia. Coli* ATCC 632	8.2	8.7	7.0	*7.97 ±0.71
2	*Salmonella typhi* ATCC 13311	9.7	9.6	9.8	9.70±0.08
3	*Pseudomonas aeruginosa* ATCC 13525	6.9	6.5	6.9	6.77±0.19
4	*Bacillus cereus* ATCC 128263	8.7	8.2	9.2	8.70±0.41
5	*Bacillus subtilis* ATCC 128263	9.9	9.2	10.2	9.87±0.42

* Values, including diameter of the well (0.85 cm), are means of three replicates,
† ± Standard deviation.

Emblica officinalis is being were traditionally used for the treatment of several diseases. Its antimicrobial potential was tested against a variety of bacteria and was shown to exert variable activities. The results of antimicrobial activity of the extract was done by agar well diffusion method have been shown in Table 4. From the data presented in the table 4, it is evident that the extract of Emblica officinalis leaves in aqueous solution showed antimicrobial inhibitory activity against all the five tested microorganism. In all bacterial strains *Escherichia. Coli* ATCC 632, *Salmonella typhi* ATCC 13311, *Pseudomonas aeruginosa* ATCC 13525, *Bacillus cereus* ATCC 128263 and *Bacillus subtilis* ATCC 128263 the zone of inhibition of test microorganisms was recorded 7.97 ±0.71, 9.70±0.08, 6.77±0.19, 8.70±0.4 1and 9.87±0.42 mm at 20 mg/ml concentration.

Conclusion:

Aqueous extract of Emblica officinalis leaves acts as good corrosion inhibitor for mild steel in 1N HCl medium. Inhibition efficiency increases with inhibitor concentration and maximum inhibition efficiency was 87% at the inhibitor concentration 10g/l. Corrosion inhibition may be due to the spontaneous physical adsorption of the biomass on the mild steel surface. Adsorption models-Langmuir, Temkin, Freundlich,and Frumkin isotherm fit well as evident from the correlation coefficient values. This proves the applicability of all the models to the process. The present study has also revealed the importance of biomass to control antibiotic resistant bacteria which are a threat to human health and can serve as an important platform for the development of inexpensive, non hazardous and effective medicine.

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